

# American Aviation

JULY 1,  
1950

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THE AIR  
INDUSTRY'S  
PIONEER  
INDEPENDENT  
MAGAZINE

## Revolution Down South

*by*  
*W. W. R.*

RIO DE JANEIRO—Before hopping off over the South Atlantic for Europe, here are some impressions gained from this third trip to South America in the past fourteen months. This time it was to participate in the inauguration of service by Braniff International Airways to Buenos Aires by the new 2450-mile non-stop route from Lima to the Argentine capital.

Revolutions are not uncommon in Central and South America but there is a new kind of revolution now in progress in the Latin countries that ought to be

of momentous importance.

It is a bold and daring revolution in transportation. At this stage it is a gamble, but if the long-range high-speed airplane does in South America what it has done in other parts of the world, the gamble will become, in fact, a revolution.

On a map an air route is just a line, and the line between New York and London looks just the same as the line between Lima and Rio de Janeiro or between Chicago and St. Louis. But the similarity is deceptive.

There is a vast difference between adding air service to a trade route already served by other forms of transport, i.e., where there is an existing traffic market to tap, and instituting a large amount of service where existing traffic and existing forms of transport have been meager.

It was only natural that the North Atlantic air service between the U. S. and Europe should carry a lot of traffic immediately—the existing volume of movement was considerable to start with. But the existing traffic between the U. S. and South America has never been very impressive, especially on the east coast where the historic trade and cultural links were with Europe. Because of the notable absence of roads and railroads within South America there has never been a great amount of movement within the continent itself.

Now, within the space of three years, there is an enormous expansion of high-speed air transport that can only be considered in pioneering terms. If the seats are to be filled, travel must be created. In 1940, just ten years ago, two U. S. carriers (PAA and Panagra) were flying six DC-3's per week into

(Turn to page 8)



### An Anniversary and a New Service

T. E. Braniff, president of Braniff International Airways, last month marked the 22nd anniversary of his airline, which started June 20, 1928, with one small plane between Oklahoma City and Tulsa. Recently his company completed its South American system by opening a new service into Buenos Aires via a 2,450-mile nonstop route from Lima. His airline now flies 11,700 miles of routes and Tom Braniff has moved into the front rank as a U.S. international air ambassador. (See adjoining editorial.)

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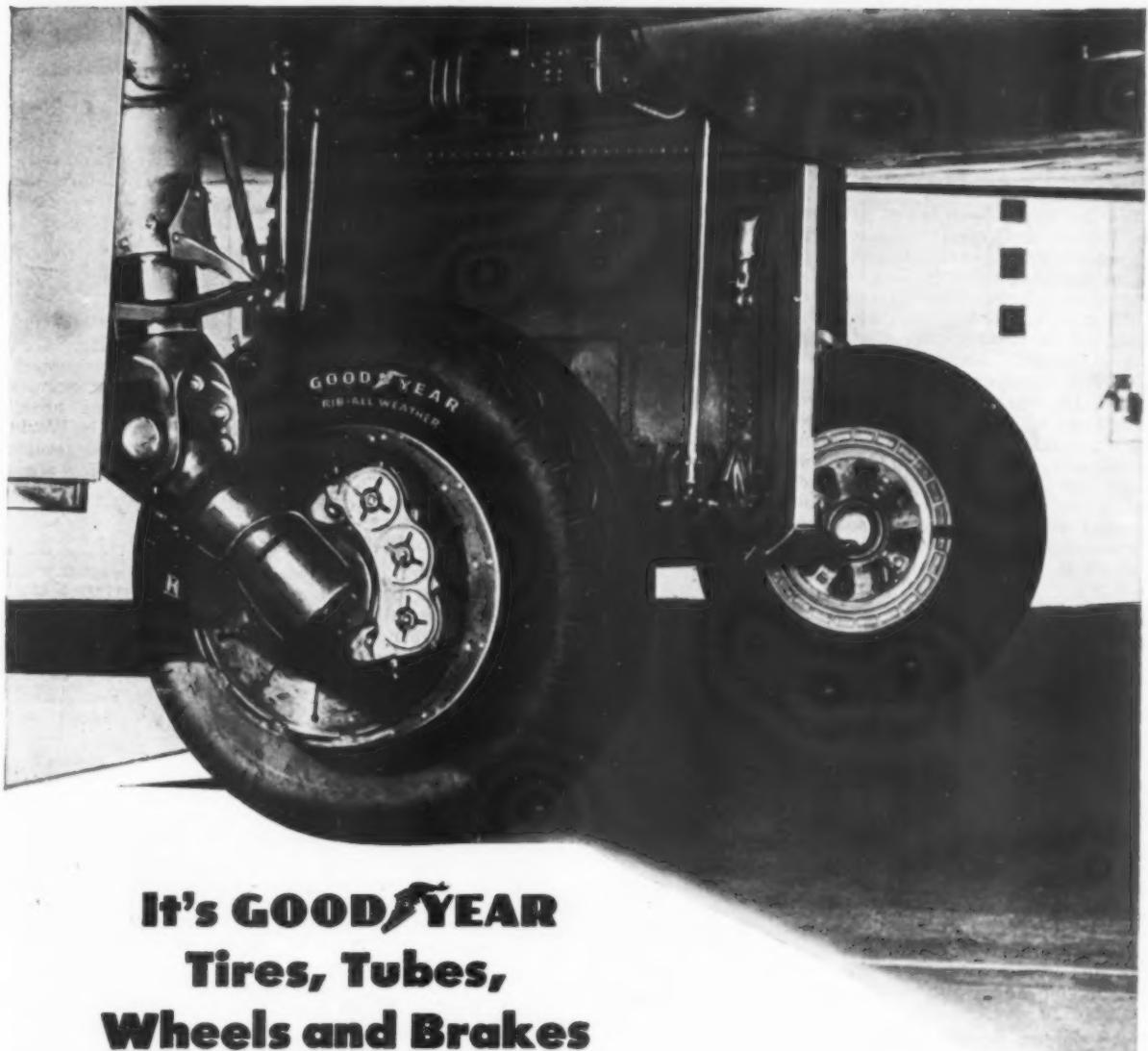
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## BACKGROUND & TRENDS

### Chinese Plane Protest

The last hasn't been heard yet about the possibility of the British in Hong Kong allowing the Chinese Communists to take over 71 planes formerly owned by China National Aviation Corp. and Central Air Transport Corp. Republican Senators are urging that the U. S. hold up further Mutual Defense Assistance Program aid to Britain until the planes are in non-Communist hands. Maj. Gen. Claire Chennault former Civil Air Transport Inc., a U. S. company, to buy the planes, but the Hong Kong Supreme Court said they should go to the Reds. The matter is now before a higher court. Sen. W. F. Knowland (R., Calif.) says we should deduct two B-29's from MDAP for every plane the Reds get, and that the State Department should do more than merely "request" that the planes be kept away from the Communists. Involved are five Convair-Liners, five DC-4's, 34 C-47's, 26 C-46's and one North American T-6.

### Below Expectations

Trans-Atlantic air traffic this summer is good, but it isn't up to expectations, and there's space available on most trips (also on steamships). Holy Year travel hasn't lived up to advance notices. Latest figures show, incidentally, that airlines are carrying about 70% as many passengers as steamships, excluding tourist class.

### Good Business

Not only is domestic scheduled airline business booming, but the non-scheduled carriers are transporting a substantial amount of traffic. Airline officials who have been observing the non-skeds state that they have been carrying between 80 and 100 passengers daily across the U. S. The non-skeds say they're going to stage a vigorous battle against CAB's proposed tough policy covering them. They're considering a mass protest flight to Washington about July 1 (see page 44).

### CAB Hires Some Help

CAB, under fire on Capitol Hill, has notified its Congressional critics that it has hired a firm of management engineers for the purpose of improving internal organization. Booz, Allen and Hamilton, of Chicago, will survey CAB internal operations and each of its divisions and make recommendations for improvement. Work is to be completed in about three months. Congressional hearings released recently show, incidentally, that there is concern in the Senate over the \$923,000 cut made by the House in CAB's 1951 budget estimate. Sen. Pat McCarran (D., Colo.) summed it up by stating that if the cuts "would mean the curtailment in any phase of the work it is a serious proposition."

### Making Money

Post Office Dept. estimates that it will take in \$13 million more in air mail revenue than it will pay to U. S. domestic airlines in fiscal 1951. Revenues are estimated at \$77.4 million, payments to airlines at \$64.3 million. Figures don't include indirect costs which PO's cost ascertainment system charges to air mail service.

### National Air Races Postponed

For the first peacetime year since 1929, there will be no National Air Races in 1950. Reason: Defense Secretary Louis Johnson wants to restrict military air-

craft participation in air shows to patriotic national holidays and events of national importance. Therefore, the National Air Races, usually held Labor Day weekend at Cleveland, have been postponed to May 19-20, 1951, to coincide with Armed Forces Day.

### Junk the Air Academy

While the Defense Department continues efforts to find a suitable site for an Air Force Academy, Rep. Carl Hinshaw (R., Calif.) says the plan should be dropped. Moreover, both the West Point and Annapolis service schools for undergraduate training should be abandoned, he said, adding that "the best officers in World War II came from the nation's colleges, not the service academies." The latter should be used only for post-graduate studies, he stated.

### Airline for Japan

Eight international airlines operating into Japan prior to Jan. 1, 1950, are to meet with Gen. MacArthur's staff to discuss formation of a non-Japanese domestic air service for Japan. After discussions and submission of proposals, one of the eight will be selected to establish and operate the service. Eligible airlines are BOAC, CATC (China), Canadian Pacific Air Lines, Pan American, Northwest, Qantas, Philippine Air Lines and Transocean.

### Bond Canceled

International Air Transport Association is currently trying to work out a new deal to bond travel agents and cargo agents. Lloyds of London informed IATA some time ago that on June 30 it was canceling the bond that had been in effect since late 1947. Reason: losses have exceeded premiums. Several thousand travel and cargo agents are involved in the coverage, including U. S. domestic agents.

### NAA Policy Shift

National Aeronautic Association is to adopt a new set of by-laws shifting policy control of the organization to the chapters in the field. Deadline for completion of the by-laws draft is Oct. 15. Until adoption of the by-laws no new officers will be elected and decision on a possible tie-in with the National Air Council will be deferred.

### EAL Favored for Transcontinental

Examiner J. Earl Cox has recommended CAB extend Eastern Air Lines from San Antonio to San Francisco-Oakland via El Paso, Tucson, Phoenix, San Diego and Los Angeles. CAB should also make permanent its approval of the Delta-American interchange, Cox said. Restrictions suggested by Cox were (1) that EAL be required on all flights between the west coast and Richmond, Va., or points north thereof, to serve at least three intermediate points between El Paso and Richmond, (2) that EAL be denied the right to serve San Antonio and El Paso on the same flights, (3) that EAL be authorized to serve traffic between San Diego, Los Angeles, Oakland and San Francisco only on flights originating or terminating at Houston or points east thereof, and (4) that EAL's east-west service at Tampa be limited to flights originating or terminating at Houston or points west thereof. He also favored designation of Austin as an intermediate point for EAL between Houston and San Antonio.



## The Grumman ALBATROSS

Can you identify these two versions of the GRUMMAN ALBATROSS? Originally developed for the Navy, the speed and ruggedness of this big plane make it a favorite of three services. The Air Force flies it on air-sea rescue operations. The Navy and Coast Guard use it as a utility amphibian. Give yourself an "A" in aircraft identification if you recognized the ALBATROSS in flight as "Navy". . . the ALBATROSS taking off as "Air Force."

GRUMMAN AIRCRAFT ENGINEERING CORPORATION, BETHPAGE, LONG ISLAND, NEW YORK  
Contractors to the Armed Forces

**Parks Begins Service:** Parks Air Lines activated a portion of its certificated feeder routes June 21 with a round-trip flight between East St. Louis and Chicago. It was the first scheduled service offered by the line since the route was awarded in March, 1948, but it was clouded by the possibility of a CAB decision in the Parks Investigation Case which may re-award the routes to other lines. Parks plans to continue daily operations over the segment, with service on the Chicago-Sioux City and Chicago-Indianapolis segments slated to begin on July 1 and July 16, respectively.

**Surcharges Cancelled:** The CAB, in a reversal of a previous decision, has approved tariffs of four airlines which propose cancellation of surcharges for DC-6 and Constellation equipment. Eastern, Delta, National and Braniff had asked permission to cancel the extra fares on June 1 but CAB suspended the tariffs and ordered an investigation. Now, however, the Board has vacated the suspension and dismissed protests of Delta and Chicago and Southern.

**Family Plan Extension:** CAB will approve a one-year extension of the half-fare family plan through June 30, 1951. Present tariffs were slated to expire at the end of June. The plan is now in effect on all but one U. S. carrier.

**No ICAO Move:** The International Civil Aviation Organization will not move its permanent headquarters from Montreal. An attempt to amend the ICAO charter to make such a move possible failed at a recent ICAO Assembly meeting when proponents failed to obtain the necessary two-thirds vote. Eighteen nations voted for the amendment, 12 against, with seven abstaining. A two-thirds vote in favor was necessary. The amendment was originally put forward by Argentina, Cuba, Mexico and Venezuela, and amended by the Netherlands.

**Lockheed Expands Factory:** A \$5,000,000 factory expansion program "to key all Lockheed manufacturing facilities to the expanding requirements of the jet age," is underway at Lockheed Aircraft Corp. Construction has already started on a new 33,000 sq. ft. factory building. Entire cost of the expansion is being borne by the company.

**LAI Gets Permit:** CAB has awarded a foreign air carrier permit to Lines Aeree Italiane S.A., for transportation of persons, property and mail between New York and Rome via Dublin, Shannon, Gander and Boston. DC-6's will be used and service will start with one round-trip weekly, increasing to two on Aug. 1. Douglas Aircraft Co. leased three DC-6's from FAMA, Argentine line, and in turn leased them to LAI for pilot training, route familiarization and actual start of service pending delivery of LAI's own ships. The Italian line's three DC-6's are scheduled for delivery Aug. 25, Sept. 13 and Sept. 30.

**Pilot Pay Investigation:** CAB has started investigation to determine whether Mid-West Airlines is violating the Act "by reason of its failure to comply with the requirements . . . with respect to minimum rates of compensation of its pilots." Air Line Pilots Association had complained to the Board, claiming violations over an eight-month period. In April, Mid-West asked CAB for an exemption because as an operator of single-engined planes it felt it should not be required to pay wage scales based on operation of faster twin-engined aircraft. CAB has taken no action on the request.

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Today's Army field force leaders are alert to the increased support they may expect from the new Thunderjet F-84-E . . . now demonstrating on active service the qualities which make it so flexible for air defense and air tactics. The Thunderjet is being used by the Air Force and the National Guard, not only as an interceptor and escort fighter, but a deadly fighter-bomber as well. It can maneuver at maximum altitudes required of independent air operations or perform vitally important close support assistance to ground force troops when needed. It is the longest range jet fighter in service today.

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**REPUBLIC AVIATION**

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## EDITORIAL

(CONTINUED FROM PAGE 1)

Buenos Aires, third largest city in the western hemisphere and seventh largest city in the world.

Starting in early July there will be nine DC-6's (seven on Panagra and two on Braniff); two Stratocruisers (PAA), and 11 DC-4's (two Braniff, two Panagra and seven PAA), per week, flying into Buenos Aires, to say nothing of a vast increase in seats available by South American and European carriers. It is difficult for anyone not familiar with the South American continent to understand the extent of the transport revolution now under way.

To my mind South America is the No. 1 laboratory for the U. S. in determining two things. One is the ability of the airplane to create new traffic. The other is to test the U. S. foreign air policy of competition on its international routes.

In regard to the first, there is no doubt that as of this summer there is an excess of seats available on U. S. carriers in and out of Buenos Aires. Spurred by the advent of a competitor, Pan American and Panagra have increased (and improved) their services into and through South America. The sales battle is on full scale, not only within the continent but in the U. S. because the American passenger with dollars is a vital key to the whole sales picture.

There are many who are pessimistic about filling those seats, but I have a feeling that time will prove that the air traffic potential to South America hasn't begun to be tapped and that what may appear to some to be a gamble today will turn out to be an investment tomorrow. South America has spruced up a lot in the past ten years. It has a lot to offer. We need closer industrial, social and cultural ties with it. Those seats can be filled—and I think will be filled.

In regard to the second test, that of fulfilling the U. S. policy of competition, even Braniff's competitors have to admit quite frankly that the advent of competition has spurred them on to better service, better operating efficiency, and broader sales outlook. All three U. S. carriers have permanent certificates, thus eliminating the insecurities of the seven-year certificates that prevail on the North Atlantic. Time may prove that the competitive policy is ill-advised and too costly, but at present there is nothing to indicate that the policy of competition has been anything but healthy for airlines, for the public, and for the U. S. as a whole.

South America could never represent a great air potential with the slow and short-range DC-3. But the DC-6 has re-made the travel pattern for the continent. Instead of three or four days from New York, with overnight stops, Buenos Aires is now but a hop and a skip from any part of the U. S.

One other thing deserves special comment. This is the manner in which Thomas E. Braniff has moved into the front rank as a U. S. international air ambassador. An insurance man of Oklahoma who got into aviation more by accident than by design, Tom

Braniff built up from a small 130-mile route an excellent domestic airline system. Since the war his horizons have broadened. Today Tom Braniff is truly a citizen of the world.

Quite apart from any competitive aspects in which an industry trade paper should play no part, it seems only proper that recognition should be given to Braniff for the manner in which he pushed forward his air network in South America and the manner in which he is moving about the world attending conferences, visiting government and airline officials, and just plain sightseeing to find out what the world is all about.

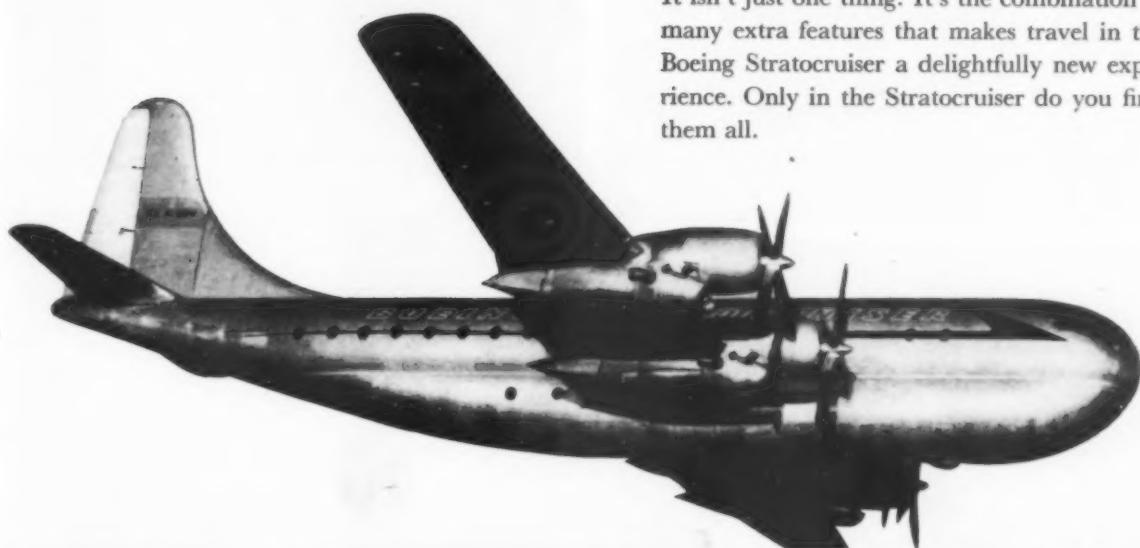
With singular poise befitting a man of stature and ability, with graciousness and understanding without being overbearing, Tom Braniff has performed, in this writer's opinion, the outstanding single job of pioneering new air routes since the war. He has learned to delegate authority, he has become a polished international host, and has done the best job (if not, indeed, the only job) of meeting with and living with people of other countries on their terms. He has become what relatively few Americans ever become—truly international in outlook.

In this postwar era of air transport in South America, the revolutionary era made possible by the long-range high-speed airplane, Tom Braniff has become a key figure. The former Oklahoma City insurance man who could have retired to a life of leisure, has become a world figure as much at home and at ease in London or Buenos Aires as in Dallas. He is making history.

WAYNE W. PARRISH.

**Safety Awards to 35 Lines:** Thirty-five airlines have received National Safety Council aviation safety awards for operating scheduled runs in 1949 without passenger or crew fatality. American Airlines received a special award for having set a new record by flying 4,476,739,000 passenger-miles between Dec. 28, 1946, and Nov. 29, 1949, when the Dallas accident terminated the record. United Air Lines received an award for completing 2,098,210,000 passenger-miles since June 17, 1948 without fatality; Pan American World Airways for 2,085,112,000 since Apr. 15, 1948; Hawaiian Airlines, Mid-Continent and Braniff for completing 20, 15 and 10 years, respectively, without fatality. Among lines awarded for completing 1949 without fatality, TWA had the greatest unbroken passenger-mile safety record with 3,440,000,000 without a fatality since Mar. 11, 1947. Colonial has operated safely 19 years and eight months. Lines receiving awards for 1949 fatality-free operations were: American Overseas, Chicago and Southern, Colonial, Continental, Delta, Inland, National, Northeast, Northwest, Panagra, TWA, Uraba, Medellin & Central, Western, Caribbean-Atlantic, Challenger, Empire, Monarch, Piedmont, Pioneer, Robinson, Southwest, Trans-Texas, West Coast, Wisconsin Central, Cordova, Ellis, Northern Consolidated, Pacific Northern, Reeve Aleutian, and Wien Alaska.

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Fleets of Boeing-built Stratocruisers are now in service on these forward-looking airlines:

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**British Overseas Airways Corporation**

**Pan American World Airways**

**Northwest Airlines**

**American Overseas Airlines**

For the Air Force Boeing builds the B-50 Superfortress, B-47 Stratojet and C-97 Stratofreighter; for the Army, the L-15 Scout liaison plane.

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# B.F. Goodrich



## New control puts each De-Icer at the pilot's fingertips

ONE PLACE where there was room for improvement in De-Icers was the control system. Pilots wanted closer, more complete control of the de-icing operation.

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The new system offers other big advantages too. Solenoid valves inflate and deflate the De-Icer much faster. Maintenance is easy and centralized. A special filter arrangement removes all oil vapors from air entering the De-Icer, improving the operation and increasing the life of the boot.

B. F. Goodrich De-Icers with this latest-type Eclipse-Pioneer plumbing system are now in use on all new 749A-type Constellations—as well as several other transport and military aircraft in the U. S. and Canada. This is another example of BFG research in aircraft icing problems. *The B. F. Goodrich Co., Aeronautical Division, Akron, Ohio.*

**B.F. Goodrich**  
**FIRST IN RUBBER**

AMERICAN AVIATION



**Future 4-0-4**—First official acknowledgement that the Martin 4-0-4 airplanes now being manufactured for Eastern Air Lines and TWA will be stressed for eventual adoption of turboprop engines has been made by The Glenn L. Martin Co. Gross weight of this version, powered by Allison T-38 engines, would be 45,000 pounds. The nacelle diameter would include provision for an auxiliary power unit. Changes now being incorporated in the Martin 4-0-4 to accommodate the turbine powerplant include 340 gallons additional fuel, restressing of the wing, pressurization equipment and possible use of a horn balance on the rudder.

## An Exclusive Look at the Martin 4-0-4

### TRANSPORT GETS ADDED STRESSING FOR FUTURE TURBOPROP APPLICATION

By WILLIAM D. PERREAULT

WHEN Eastern Air Lines and Trans World Airlines take deliveries on the recently ordered Martin 4-0-4's they will be operating an airplane which is in many ways superior to the earlier Martin 2-0-2. It will provide for:

- more passengers,
- higher gross takeoff and landing weight,
- greater range, and
- improved performance.

Presented here for the first time, following interviews with Martin engineers, is an exclusive story on the exact nature of these changes.

While the future of the airplane as a turbine-powered aircraft remains a matter yet to be decided on,

Martin engineers are making some specific changes in the Martin 4-0-4 aimed at making the transition from reciprocating to turboprop engines with a minimum of modification.

These changes, such as the restressing of the wing to provide for the greater bending moment (which will accompany the use of turboprop engines), installation of a pressurization system, higher design speeds, increase in fuel capacity by 340 gallons, and the proposed use of a horn balance on the rudder for improved low-speed control with higher engine powers, will serve to make the Martin 4-0-4 a promising airplane for the long-range future.

#### New or Modified

Like all the other aircraft manufacturers, Martin has a project group

working on the facts and figures which will ultimately tell the story regarding the use of turbine engines in the existing airframe. Similarly, they are carrying on parallel studies of a new turboprop replacement for the 2-0-2's and 4-0-4's to determine what the relative advantages of a completely new airplane might be versus a modified 4-0-4.

Martin engineers feel that the 4-0-4 is well suited for turboprop power, but that the real key to a practical turboprop airplane remains the question of engine development. The availability of the Allison T-38 turboprop engine, the only suitable powerplant now in sight, in quantities for commercial service and with reliability and fuel consumption which will make them economically feasible,

appears to be more than a 12- or 18-month project.

Martin feels the 4-0-4 airframe has inherent qualities which make it attractive for turboprop power. While the Martin 2-0-2's now in service are certificated at a gross weight of 39,900 pounds, tests are now about complete to move this to 41,600 pounds, possibly directly to 42,750 pounds. The 4-0-4 will definitely be certificated at 42,750 using 100-octane fuel. It is likely that use of 108/135 or 115/145 will make it possible to raise the approved gross to 43,900 pounds before the airplane enters service.

#### 45,000-Lb. Gross

The entire airplane is designed for a gross of 45,000 pounds. This weight increase must be absorbed without adversely affecting the center of gravity limits. In adding 39 inches to the fuselage, Martin added 13 inches forward of the wing and 26 inches aft of the wing. The result is that the airplane will enter service with a rearward CG limit of 38½% of the chord, a CG range which will simplify the problem when and if turboprops are decided upon.

To reduce airframe stresses during landings and provide maximum passenger comfort on landing when the gross weight is increased to 42,750 pounds, it is proposed to modify the landing gear drag link. This will be fitted with a snubbing link similar to that used on some of the larger four-engine transports. The oil and spring strut was designed in the Martin shops and is presently at Menasco Mfg. Co. being tested.

While still not at maximum, Martin has added fuel tankage in the outer wing panels which raises fuel capacity from 1,010 to 1,350 gallons. Using additional Mareng bags, Martin engineers have maintained system simplicity by making the new tanks an integral part of the original main tanks, thus making additional controls unnecessary.

AiResearch Mfg. Co. pressurization equipment is being added to the Martin 4-0-4. This system will feature

a new variable-speed drive which will make it possible to keep the airplane cool while it is on the ground. The system operates in such a manner that full output can be obtained at low engine rpm. As engine speed picks up the gear drive ratio is changed to suit the operating condition. An expansion turbine, mounted in the belly of the airplane forward of the front spar will cool the air for this usage.

In operation the AiResearch unit will provide a pressure differential of 3 psi, the equivalent to 8,000 feet pressure altitude in the cabin at 16,000 feet altitude. To accommodate the necessarily higher stresses imposed by pressurization, the windows in the 4-0-4 will use either Seeracin, a non-crazing plastic, or plate glass instead of Plexiglas. New attachment fittings will be used to secure the double-pane windows, either of which will withstand full system differential.

The additional fuselage length, bringing overall length to 74 feet, 7 inches was made in a section of constant diameter. Relocation of two of the six emergency exits into this same constant section area now makes it possible for one emergency exit to fit any one of the escape hatches.

#### Improved Visibility

The cockpit visibility in the 4-0-4 will be substantially improved over that of the Martin 2-0-2. To accomplish this the small triangular windows above the main forward view sections of windshield have been eliminated and some three inches of window height has been added across the entire width of the cockpit. Side windows have been extended approximately the same amount.

Both TWA's and EAL's airplanes will have substantially the same interior arrangement (see cut). Major difference will be in the mounting of radio equipment. TWA will have its communications gear mounted on horizontal racks on the left side of the fuselage. Eastern will use vertically

mounted racks on the right side of the fuselage.

While the basic airline-Martin agreement specifies conventional antennae equipment, it is agreed that Martin will investigate the possibility of submerging certain of the antennae. At present Martin communications engineers expect this might be accomplished with the glide path antenna flush mounted in the nose, the omni-directional range antenna in the dorsal fin aft of the pressure seal and the VHF antenna in the tip of the vertical fin.

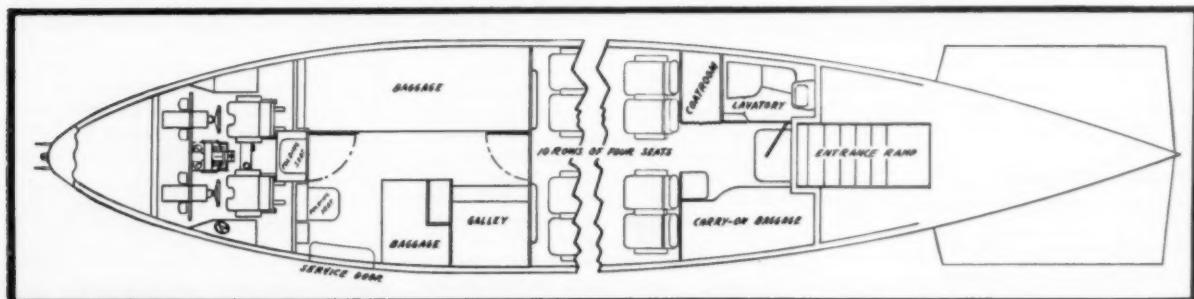
It would appear that the nose-mounted antenna might call for some change in the present arrangement which calls for the use of a large white taxi light in the nose with the pitot heads for the airspeed indicators on either side of this and a red passing light above the white light. The red light would be manually keyed for flashing separate of the navigation light flashing system.

#### Other Changes

The thermal deicing system in the 4-0-4 will be improved by the installation of new Surface Combustion Corp. heaters in place of earlier units and by the redesign of the wing heating ducts. Experience with the 2-0-2 brought out shortcomings in the distribution of heat to the outer wing panel leading edge. By providing direct ducting away from the leading edge this has been corrected in the redesigned system. While the air conditioning system remains basically the same with the exceptions noted above, the heaters in this system also have been changed to Surface Combustion units.

Other changes include use of carry-on baggage racks on the left side of the fuselage at the top of the integral loading door and a redesigned lavatory on the right side of the fuselage opposite the baggage rack. The redesign provided room for a coat rack forward of the lavatory.

A new and smaller escape hatch has been provided through the rear



**The Interior**—of the Martin 4-0-4's scheduled for delivery to EAL and TWA. In the cabin area, deleted in this drawing, the fuselage is of constant section with seats four abreast. Six emergency exits, three on each side, are provided. The baggage

compartments have a total capacity of 344 cubic feet and weight capacity of 4,700 pounds. Coat-room space has been provided by a redesign of the lavatory area. Except for the radio rack, both airlines have the same basic interior layout. TWA's communications gear is on the left side of the fuselage, EAL's on the right.

door and pressure seal. Also, heating ducts in the 4-0-4 will be in the ceiling lowering the level slightly and providing a flat rather than fully rounded ceiling.

Without question the improved Pratt and Whitney R-2800 CB-16 engines make a major contribution to the airplane's new performance guarantees. The CB-16 has the same basic 2,400-horsepower rating but improved altitude performance:

#### P&W R-2800 CB-16 Engine

	Brake Horse- power	Altitude RPM	
Take-Off (wet)	2400	4,000	2800
Take-Off (dry)	2050	6,000	2700
Normal Rated			
Low blower	1800	8,500	2600
High blower	1800	16,000	2600
Maximum Continuous			
Low blower	1800	8,500	2600
High blower	1700	14,500	2600

This improved engine, coupled with the increased fuel capacity and inherent design characteristics have made it possible to guarantee promising performance. The 4-0-4 will cruise at 16,000 feet altitude on 1,200 bhp per engine at 270 mph and a gross weight of 38,000 pounds.

At its maximum gross weight of 42,750 pounds, it will take off over a 50-foot obstacle in 3,680 feet. With full gross it will climb at 1,300 feet per minute while at 41,000 pounds at 1390 fpm. Its distance to land and stop is 2,300 feet requiring an effective runway length at 3,840 feet.

#### Payload-Range Data

Cruising at 16,000 feet altitude the Martin 4-0-4 will carry 10,000 pounds payload at 253 mph over an operational range of 410 miles; 8,000 pounds payload at 254 mph some 860 miles or 6,000 pounds payload at 256 mph for 1,340 miles range.

These figures represent guaranteed performance on the Martin 4-0-4 with present engines. The 4-0-4 structure is stressed for cruising speeds up to 363 mph at 20,000 feet altitude. Use of the present Allison T-38 would permit cruising speeds up to 340 mph, a practical top speed for an airplane designed to serve the routes over which this plane will be flying.

Payload will depend largely on a more detailed knowledge of specific fuel consumption and operating altitudes than is yet available but the higher power of the Allison T-38 (present 2,750 horse-power) will provide the 45,000 pound turboprop version 4-0-4 with shorter takeoff than now experienced with conventional engines. Martin's figures show and it should provide operating costs which are at least 30% lower than the piston engine versions. Higher engine powers (as high as 3,750 horsepower) will mean even better performance.



**Time Counts**—Marion Hart, 59 year old pilot, runs to the time clock in the operations office at Tucson Airport to have her flight log punched at the end of the first lap of the All Women Transcontinental Air Race. Chuck Broman, assistant airport manager, leads the way.

## Operators See Sales Value In Women's Lightplane Race

By BARBARA WARD

WHEN the last of the entrant planes in the 1950 Ninety Nines' All Woman Transcontinental Air Race buzzed the finish line on the north-south runway at Greenville, S. C., June 15th, something had been proved besides the fact that a woman can fly across the continent. That had already been proved.

What was questionable was the feasibility of a group of average women—half of them mothers and one a grandmother—taking just any factory aircraft and flying it clear across the country. Are today's lightplanes that safe, and can weekend pilots do it?

They are and they did. Of 33 lightplanes starting the transcontinental race from San Diego, California, 26 had crossed the finish line at Green-

ville, S. C., within five days. Seven planes and their crews had been eliminated by mechanical trouble or by overnight stops at unauthorized airports, but not a person was injured and the only aircraft damage was one bent propeller.

The women pilots came from all kinds of occupations—beauty parlor operators, housewives, crop dusters, secretaries—and the planes had an

equally varied background. Begged, borrowed, rented or owned, few of them were new and most of them had been picked up by the pilots from friends or flight schools a few days before the start of the race on June 11th.

#### Elderly Airplanes

One plane, a Waco ZCG-7, was almost as old as Betty Gillies' sixteen-year-old daughter who was copilot of their Navion. My Ercoupe was not unique in its three years of flight training and, as John Hawkins of Hawthorne Flying Service at Charleston Airport observed, "That's no spring chicken."

And neither were some of the women pilots. Due to good maintenance and fresh paint jobs, you never would know it, but Juanita Pritchard, who flew the "Pittsburgh Pacer" for Piper Aircraft, is a grandmother and Marion Hart, who learned to fly after the war and who flew her Cessna 170 alone across the country in the race, is 59 years old.

Young or old, new or old, as long as the engine kept turning, anyone could win the race. None of the planes were stripped down or "souped up," since it was a race of standard aircraft. They were flown as they were sold. Each was handicapped for the 2,460 mile race by dividing this mileage by the advertised cruising speed of the aircraft to give the handicap in flight hours.

The "Red Meteor" Ercoupe spon-



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**Stellar take-off and landing performance**

Short fields are no problem! New Beechcraft propeller develops greater static thrust. Flap travel is increased; action is faster.



**Plan long flights — you have the range!**

The Bonanza's 750-mile range can be increased to 940 or 1,145 miles by installation of 10-gallon or 20-gallon auxiliary fuel tanks.



**Extra style and comfort features**

Touches of luxury: four arm rests, four individual ash trays, special coat hanger rod to carry clothes with never a wrinkle.



**Take-off horsepower rating increased**

Now 196 h.p. at 2,450 rpm. Landing gear action speeded up: lowered in 7½ seconds, raised in 8½ seconds at 105 mph.



**Room for all the luggage you need!**

Baggage compartment is accessible from inside or out. Room, too, for four big people in the smartly tailored quiet cabin.



**Sturdy framework gives you unsurpassable safety**

All-metal framework is stronger than conventional construction. Exceptionally rugged: Shock, stress tests far surpass CAA requirements.



**There's more** to the Bonanza story! Let your nearest Beechcraft distributor or dealer "fill you in" on facts about the Model B35 Beechcraft Bonanza's exceptional economy in operation. Or for more information, write on your letterhead today to Beech Aircraft Corporation, Wichita, Kansas, U.S.A.

**Top speed, 184 mph  
Cruising speed, 170 mph  
Range, 750 miles  
Fuel economy, 9.5 gph**

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sored by AMERICAN AVIATION had a 75-hp. Continental engine, a speed of 105 mph and a handicap of 23.43 hours. Gas stops counted in as flight time, with time figured from the first takeoff of the day to the last landing at night. Actually, "race" is a misnomer; it was a cross-country competition, each plane trying to better its own handicap and each pilot intent on navigating a direct line.

Since the Ercoupe and I both were new to transcontinental air races, it was good to find Bob Fisher of Fisher Aircraft Co., out on the line at Lindbergh Field to wave me into parking position and explain the procedure. All planes were impounded for inspection the day before the race.

W. M. D'Estout, CAA official in charge of approving the planes for race entry, was going quietly berserk measuring propellers, running power checks on the engines, inspecting planes for unauthorized modifications and trying to locate log books and weight and balance evidence.

### Takeoff

But by 1:00 p.m. Sunday, all planes were approved and lined up in order of takeoff, each engine warmed up and then the gas tanks topped to assure that extra half gallon.

As the flag dropped and the first plane pulled out on the runway and took off, planes down the line were given the signal to start their engines. It went like clockwork. Including time for two airliners to come in and land, the 33 race planes were off the ground in 19 minutes.

The grind of compass, altitude, map, airspeed, compass, altitude, rpm, map, gas, compass and check points went on against a varying backdrop. Jagged mountains reaching up between San Diego and Tucson, blistering desert stretches in Arizona, scrubby mesquite-covered hills of West Texas and cities standing up from the plains. 75 horsepower, 130 gallons of gas and a picture that Designer Fred Weik drew on an engineer's drawing board took me across the continent in 24.46 flying hours.

And sponsors. Of the 33 race entrants, only seven planes were privately financed. All of the others were officially sponsored with expenses paid by everyone from the Merchants of El Cajon to Star-Kist Tuna of Terminal Island. The Vallejo Junior Chamber of Commerce, Santa Ana Chamber of Commerce and the City of Concord were the municipalities acting as sponsors.

The Luscomb flown by Mary Disney of Napa, California, had no less than 50 sponsors from among the "public spirited citizens of Napa," 46 of whose names appeared on the plane. Interestingly, not one of the sponsors of this flying billboard were in the aviation business; they ranged from the local radio station to the A-1

## 1950 Ninety Nines All Women Transcontinental Air Race

From San Diego, California, to Greenville, South Carolina

### Order of Placing

	Plane	Cruising Speed	Handicap	Elapsed	% Score
1. Jean Parker	Taylorcraft	95	25.89	20.01	1.2934
Boots Seymour					
2. Elizabeth Lambert	Cessna 120	101	24.36	20.36	1.1825
Claire Hale					
3. Aileen Pickering	Cessna Patroller	111	22.16	18.49	1.1776
Irma Story					
4. Claire McMillen	Cessna 140	111	22.16	19.43	1.1239
Claire Davis					
5. Darline Sanders	Cessna 120	101	24.36	22.46	1.070
Dodie Prario					
6. Juanita Pritchard	Piper Pacer	125	19.68	18.43	1.0514
7. Darline Thurmond	Piper Clipper	112	21.96	21.05	1.042
8. Marion Hart	Cessna 170	121	20.33	19.33	1.039
9. Gladys Davis	Mooney	115	21.39	20.35	1.038
10. Ruth Deerman	Cessna 140	111	22.16	21.37	1.025
Ruby Hays					
11. Lois Hailey	Luscombe	115	21.39	21.08	1.012
Lois Ziller					
12. Betty Gillies	Ryan Navion	170	14.47	14.19	1.010
Pat Gillies					
13. Virginia Stover	Ercoupe	105	23.43	23.36	.9915
Mildred Mandeville					
14. Iris Critchell	Taylorcraft	95	25.89	26.22	.982
Nancy Crans					
15. Ann Grogan	Mooney	115	21.39	22.35	.956
16. Barbara Ward	Ercoupe	105	23.43	24.46	.946
17. Yvette Kovary	Mooney	115	21.39	22.45	.940
18. Martha Ann Woodrum	Bonanza	172	14.30	15.21	.9315
Mary Ann Weatherby					
19. Mary Disney	Luscombe	115	21.39	23.01	.9239
Ruth Gamber					
20. Donna Evans	Trojan	110	22.36	24.24	.916
Lila Hobday					
21. Lenore McElroy	Bonanza	172	14.30	15.40	.912
22. Lois Bartling	Swift	140	17.57	20.12	.8698
23. Arlene Davis	Cessna 195	166	14.82	17.26	.839
24. Mildred Harshman	Bonanza	170	14.47	18.09	.797
25. Marjorie Crowl	Cessna 140	101	24.36	35.12	.691
Donna Davis					
26. Mary Ring	Aeronca	90	27.33	39.57	.6841
Helen Dick					

Eliminated: Irene Leverton, Jane Page, Viola Lyons, Monnie Dye, Mary Kitson, Isabelle McCrae, Joanne Greenman, Geri Masinter, Mary Packard.

Cafe on Main Street to the Rough Rider Pants Factory and the Napa Grocery. If they weren't interested in aviation before the race, they are now.

### Operators Laud Race

Airport operators across the country were unanimously in favor of the race. "It's a good thing for aviation. If women can do it, it's easy enough for anyone and besides, the race gets good publicity and brings people to the airport," was the answer I got at airport after airport. In Charleston, the unpatriotic comment was, "Something like this will sell more airplanes than all of Bevo Howard's acrobatics."

The effect of the air race on the cities it touched is difficult to assess. In Tucson, about 200 cars were at the airport to watch the girls come in, cut their engines and run for the time clock to have their logs punched. In Odessa, Texas, the city putting up the \$1,500 purse, there was a large group at the airport and the city gave a chuck wagon barbecue for the race entrants and city officials.

Meridian, Mississippi, invited the race entrants to be guests during their stay at the hotel, and in almost every authorized overnight stop there were radio interviews and write-ups in the local newspapers. In Charleston, again, all expenses were paid by the city and in Greenville, the terminating point of the race, one would have had to be deaf and blind to miss the fact that an air race had come to town. Policemen with sirens escorted the Packard cars provided by Harry Bridges for "official" transportation. There were cocktail parties, visits to private homes, a banquet every evening, Thursday through Saturday, and a Sunday air show.

Officially, Jean Parker and Boots Seymour of Arcadia, California, won the race in their Taylorcraft. Handicapped at 95 mph for an elapsed time of 25.8 hours, they made the flight in 20.01 hours. Unofficially, every plane and every girl that entered the race won. 26 of the 33 planes finished without being disqualified. And they all did it safely.

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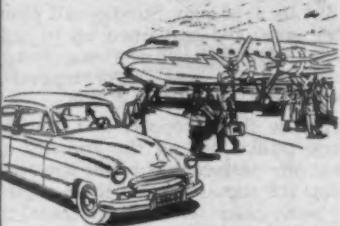
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# Big Push from a Small Package

By JAMES J. HAGGERTY, JR.

**I**N 1947 the Bell X-1 first flew faster than sound. Some time later another research airplane, the Douglas D-558-II, duplicated the feat. More recently an American-built guided missile, the Martin Viking, reached an altitude of 106.4 miles for a new American single-stage rocket record.

These accomplishments have been well publicized and the manufacturers of the airframes have been appropriately credited. But little or nothing has been said about a very important part of these projects—the rocket power plant.

One small, practically unknown company provided the power for all three of the above mentioned projects—Reaction Motors, Inc., of Rockaway, New Jersey. Located in the lake area of northern New Jersey, which is rapidly becoming a rocket center, RMI has grown from a handful of employees to the country's largest liquid-propellant rocket manufacturer in eight years.

RMI has about 100,000 square feet of working space in its new, recently leased quarters at Rockaway and a large engineering and test area with sixteen test cells at Lake Denmark, five miles away. The test cells represent an investment of about \$2,000,000; they are presently capable of handling rockets ranging in thrust capacity from 50 to 60,000 pounds, although RMI's largest rocket at present is the 20,000-pound Viking power plant.

The principle behind RMI's line of

liquid-propellant rockets is a very simple one. In a given airframe, whether it be a piloted plane like the X-1 or a pilotless one like the Viking, there are two tanks, one containing the fuel and the other an oxidizer. The fuel, in most cases, is alcohol; the oxidizer, liquid oxygen.

The problem is to bring them together in a cylinder and ignite them; the resulting reaction produces the propulsive thrust from the rear of the cylinder. RMI has two ways of forcing the fuel and oxidizer from their tanks through fuel lines into the cylinder; by a pressurization system, using nitrogen as the pressurizing agent, or by a turbine pump, which pumps the liquids through the lines. The igniter, located at the head of the cylinder, is actually a miniature rocket engine, drawing its fuel through bleed-offs from the main fuel lines; an ordinary spark plug provides the ignition.

The igniter can be eliminated altogether in another type of rocket engine. By using fuming nitric acid instead of the oxygen as an oxidizer, and aniline as the fuel, automatic ignition is achieved, since the confluence of the acid and alcohol will bring about a spontaneous ignition.

## X-1 Powerplant

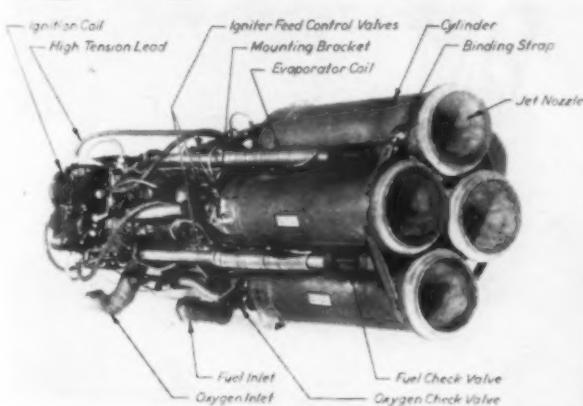
Perhaps the best known RMI product is the Model 6000C4 engine (Air Force designation XLR-11-RM-1) which powered the X-1 past the speed of sound. The 6000C4 consists of four cylinders, each of which develop 1,500 pounds thrust. In this

particular engine alcohol is the fuel and liquid oxygen the oxidizer and the nitrogen pressure system is used to force the liquids into the burner chambers. Throttle control is achieved by firing one, two, three or four cylinders, thereby producing 1,500, 3,000, 4,500 or 6,000 pounds thrust.

## Simpler System

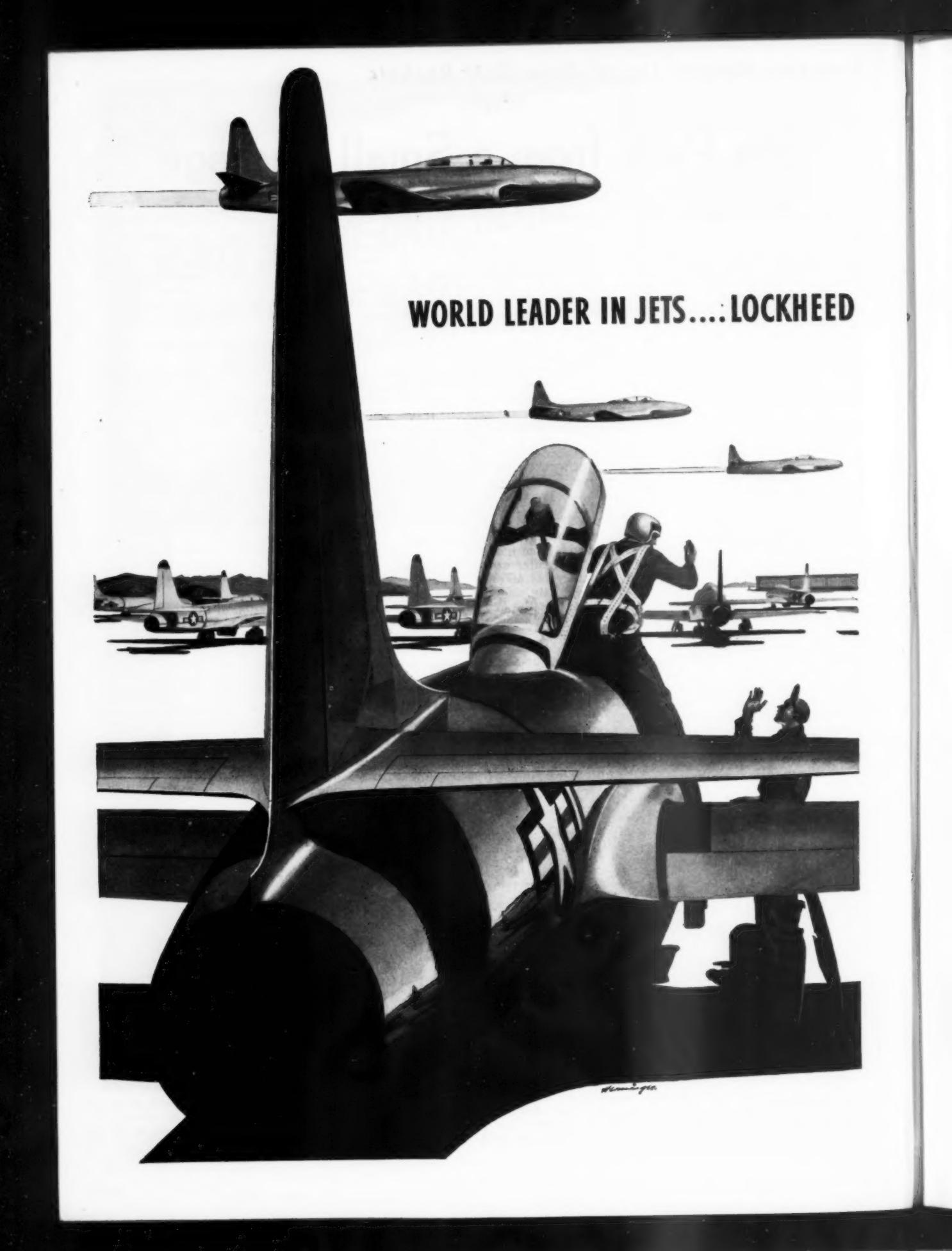
RMI could have built the engine with just one large 6,000-pound cylinder but the problems of developing a throttling system in the time available which would enable the pilot to vary his thrust output were so great that the four-cylinder engine was decided upon as the simplest. Thus the pilot can regulate his thrust by firing as many cylinders as he needs. There is no way to fire, say, three and one-half cylinders to get 5,250 pounds thrust; however, in the X-1 special research program there was no requirement for such intermediate thrust ratings.

The D-558-II is powered by a modified version of the 6000C4 (Navy designation LR-8-RM-2) (it also has a jet engine for basic power; the rockets are used for auxiliary thrust). The D-558-II installation is equipped with a turbo-pump fuel system instead of the nitrogen pressure system. In this installation, hydrogen peroxide is burned in a small cylinder separated from the main engine. The decomposed gases exhausting from the small cylinder drive a turbine, which in turn operates the fuel pumps. The pumps force the fuel and



**X-1 Engine**—This is the Reaction Motors XLR-11-RM-1 rocket power-plant, which pushed the Bell X-1 special research plane past the speed of sound. The fuel (alcohol) and the oxidizer (liquid oxygen) enter each of the four cylinders through their respective inlets (shown) and are ignited. The resulting reaction forces 1,500 pounds of thrust out of each of the four cylinders. At right, the same engine with three cylinders in operation, is run on a test stand.





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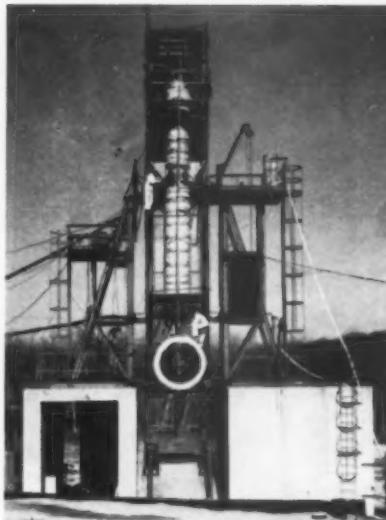
Important member of the Lockheed jet family is the two-place T-33 Jet Trainer (shown here), only jet trainer airplane built in America today (Navy designation: TO-2). This dual-control fighter-trainer now trains the pilots for the supersonic fighter planes of the Army, the Navy and the Marine Corps.

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**Viking Engine**—The small cylinder (circled) is the Reaction Motors XLR-10-RM-2 rocket engine, which develops 20,000 pounds of thrust and has pushed the big missile up to an altitude of 106.4 miles. At left, RMI engineers prepare the engine for a test run with a Viking mock-up which contains all of the necessary fuel cells. At right, an actual Viking firing.

oxydizer into the burner chambers. The turbine pump system permits greater duration of flight and faster speeds.

### Doubles Thrust Duration

The Bell X-1A, improved version of the X-1 which is expected to fly late this year, will also use a turbo-pump fuel system engine. The pumps will permit a full-thrust flight duration of close to five minutes in the X-1A where the X-1 could operate at full power only two and one-half minutes. The X-1A will also have a design top speed of 1,700 miles per hour; the nitrogen system in the X-1 limited the maximum speed to about 1,000 mph. RMI has already delivered the first two turbo-pump engines for the X-1A to Bell Aircraft Corp.

Perhaps the most sensational of RMI's engines is the Viking power plant, a single cylinder unit which develops 20,000 pounds thrust. The engine, which has a cylinder diameter of 20 inches, is known in the company as the Model 20,000C1, and in the Navy as the XLR-10-RM-2. It is a pump-fed unit using the alcohol-liquid oxygen fuel combination.

RMI is now exploring the possibilities of raising the thrust in the 20,000C1 to 30,000 pounds. This can be done by raising the feed pressure of the fuel pouring into the cylinder, probably through the use of a larger pump. The 20,000C1 is an example of the tremendous thrust available to missile builders. With a single-cylinder developing 20,000 pounds thrust, there is no reason why an 80,000-pound unit could not be built by constructing a four-cylinder engine.

Such an engine, RMI engineers state, would have an envelope diameter of only 48 inches, not at all prohibitive for missile use. RMI is building 10 engines for the 10 Vikings the Navy has ordered from The Glenn L. Martin Co. Four of the missiles have already been fired.

### Largest Order

RMI's largest production engine is the LR-2-RM-2, power plant for the Fairchild Lark, a Navy ground-air target-homing missile, some 200 of which are on order. Although it is RMI's largest project from the standpoint of quantities ordered, it is actually one of the company's smaller engines from the thrust standpoint, developing a total of 620 pounds. The Lark engine uses the gas pressurized fuel system, but instead of the liquid oxygen-alcohol combination in the other rockets it employs aniline as the fuel and fuming nitric acid as the oxydizer. This combination generates a spontaneous ignition in the burner chamber, eliminating the need for an igniter.

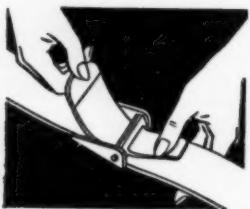
The LR-2-RM-2 has two cylinders, a small one which develops 220 pounds thrust and a larger one which turns out 400 pounds. The small cylinder is used for cruising power; the larger one is cut in as an auxiliary when added speed is needed. A guidance system within the missile decides when added power is required and automatically cuts in the second cylinder.

Another RMI project was the power plant for the Air Force's MX-774, a ground-to-ground rocket test vehicle built by Consolidated Vultee Aircraft Corp. This engine, known as the Model 8000C4 was generally similar to the 6000C4 which

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**Burden, Norton Buy Stock;  
Elected to RMI Board**

The control of Reaction Motors has undergone a slight change with the addition of William A. M. Burden and Garrison Norton to the company's major stockholders. At a directors' meeting June 23, Burden, former Assistant Secretary of Commerce for Air, and Norton, former Assistant Secretary of State, were elected to the RMI board, following their partnership purchase of a substantial block of RMI stock. The announcement did not list the percentage of stock made available to the Burden-Norton partnership, but it stated that the transaction will provide the company with additional capital and supplement the Rockefeller interest.

powered the X-1, although, as is obvious from the designations, it developed 8,000 pounds thrust compared to the 6,000 pounds available to the X-1.

**Four Cylinders**

The 8000C4 employed the four-cylinder system, each developing 2,000 pounds thrust, and burned the liquid oxygen-alcohol combination. A unique feature of this engine was a design which permitted swiveling the cylinders in flight. By so altering the direction of the thrust, the missile could be steered. Three MX-774's were built and fired successfully but the project is now dormant.

That about rounds up RMI's rocket projects which the military will allow to be discussed. In addition, the company is also doing research on new high-energy fuels for rocket propulsion, designing new methods of throttling rocket cylinders and devising new applications for rocket propulsion, such as for boats and rotary wing aircraft. RMI is also working on a new engine design which would use the very promising combination of acid and ammonia as a propellant; the design has been submitted to the Navy.

**Formed in 1941**

RMI was founded in 1941 by four members of the American Rocket Society, one of whom, Lovell Lawrence, is now the company president. During the first few years of its existence, RMI operated on a very small scale in various locations in northern New Jersey.

After the war the Navy made available a group of buildings and a test area at Lake Denmark, where



### Fairchild's Pack Plane—

Fairchild Aircraft Division's XC-120, new Air Force detachable fuselage transport, has been rolled out of its hangar for ground and taxi testing prior to first flight, scheduled for July. The fuselage, or pod, may be detached from the plane and towed away, saving time in loading and unloading operations (American Aviation, June 1). Note the quadricycle landing gear and the eight wheels on the pod itself for ground movement. Power plants are Pratt & Whitney Wasp Majors of 3,250 horsepower each.

the engineering and test operations are still conducted. The Lake Denmark area is now growing into a rocket test center. Besides RMI, the Army Ordnance Department's solid rocket test center, the Naval Air Rocket Test Station and a classified Bendix Aviation Corp. rocket project are all located in the area.

The company's administrative and financial policies are dictated by Charles W. Newhall, Jr., executive vice president and general manager. Newhall, technical and aviation advisor to Laurance S. Rockefeller during 1946 and 1947, took over as executive vice president of RMI in 1947 when Rockefeller bought control of the company. Prior to joining Rockefeller, Newhall served as a colonel in the Air Force in charge of distribution of Air Force and lend-lease aircraft.

### PEOPLE IN THE NEWS

**Charles D. Frazer**, since 1947 executive secretary of the National Air Council and editor of its publication "The National Air Review," has been elected executive vice president of the organization and will be in charge of its new office in Washington.

**R. W. Williams** has returned to Air Cargo Inc., from which he took a leave of absence because of illnesses in his immediate family, and has been re-appointed eastern regional manager with headquarters in New York. **S. W. Taylor**, who has held the regional post, will re-enter the motor trucking business in Atlanta.

**John Thad Scott, Jr.**, of Houston, has been named chairman of the National Mediation Board to succeed **Francis A. O'Neill, Jr.** of New York, who continues

as a member of the Board. Rotation of the chairmanship is required under the Railway Labor Act.

**Avery McBee**, formerly manager of the Honolulu office of N. W. Ayer & Son, Inc., and before that director of public relations for The Glenn L. Martin Co., has been appointed vice president of Hill & Knowlton, Inc., public relations counsel, in New York.

**Howard F. Rough**, who has been serving as Assistant to the Civil Aeronautics Administrator for Field Relations, has been named Civil Aviation Adviser at Paris under a joint arrangement of the Department of State and the CAA. Remaining on CAA rolls, he will advise both U. S. and foreign diplomatic establishments on technical aspects of aviation matters and will shape advice to State Department and CAA on U. S. aviation policies.

**Robert H. Sommers** has resigned as secretary-manager of the Los Angeles Junior Chamber of Commerce to become head of the aviation department of the Chamber. His former post was taken on by **Richard B. Thurber**, former executive director of the California Aviation Trades Association.

**Arthur Godfrey**, radio and television star, has been named a member of CAA's Aviation Development Committee for a two-year term and also has been designated an honorary member of the Airports Advisory Committee.

**William J. Haley**, coordinator of the refining operations of Standard Oil of New Jersey, has been elected president and a director of Esso Export Corp., succeeding **Frank M. Balling**, who is to retire in the near future. Succeeding Haley as head of the refining coordination department is **Harold W. Fisher**, former deputy coordinator.

### Aviation Calendar

July 1-4—Northeastern States Soaring Contest, Harris Hill, Elmira, New York.

July 5-7—University Aviation Association annual meeting, Peabody Teachers College, Nashville, Tennessee.

July 12-14—Institute of the Aero-nautical Sciences annual summer meeting, IAS Western Headquarters Bldg., Los Angeles, California.

July 14-16—National Pilots Air Meet and Races, Chattanooga Municipal Airport, Chattanooga, Tennessee.

July 17—Conference of National Aviation Organizations first meeting, Washington, D. C.

July 25-30—Academy of Model Aeronautics national model airplane championship contest, Naval Air Station, Dallas, Texas.

July 30-Aug. 13—National soaring contest, Grand Prairie, Texas.

Aug. 1-17—CAB Annual review of airworthiness regulations, Washington, D. C.

Aug. 19—Tennessee Air Progress Conference, Knoxville, Tennessee.

Aug. 19-20—1st Annual California Air Freight Clinic, Oakland, California.

Sept. 2-4—National Air Races, Cleveland, Ohio.

Sept. 4-6—National Flying Farmers Association annual convention, Bemidji, Minnesota.

Sept. 12-14—Conference on Ground Facilities for Air Transportation, Massachusetts Institute of Technology, Cambridge, Massachusetts.

Sept. 28-30—Air Reserve Association annual convention, Hotel Texas, Ft. Worth, Texas.

Sept. 28-30—International Northwest Aviation Council 14th annual convention, Sun Valley, Idaho.

Oct. 2-4—National Association of State Aviation Officials annual convention, Minneapolis, Minnesota.

Oct. 17-18—Third annual New York State Airport Management Conference, Syracuse, New York.

Oct. 19-20—Tennessee Aviation Conference, Knoxville, Tennessee.

Oct. 26-27—Fifth Annual Aviation Conference, Tucson, Arizona.

### International

Sept. 5-10—Society of British Aircraft Constructors annual flying display and exhibition, Farnborough, England.

Oct. 12—IATA Executive Committee meeting, San Francisco, California.

Oct. 16-20—IATA Annual general meeting, Fairmont Hotel, San Francisco, California.

Oct. 23—IATA Executive Committee meeting, Montreal, Quebec.

October—ICAO Rules of the Air/Air Traffic Control Division Meeting, Montreal, Quebec.

November—ICAO Airworthiness/Operations meeting, location undecided.

November—ICAO Middle East regional meeting, tentative, location undecided.

**Between the Lines:**

# Aircraft Wage Decision

By James J. Haggerty, Jr.



WE HAVE been listening for some time now to Defense Secretary Louis Johnson's trumpeting about cutting out the fat and leaving only muscle in the defense establishment and about getting the most defense for the taxpayer's dollar.

Just recently, for instance, in Congressional testimony, the Secretary said: "We are converting fat to muscle . . . By getting rid of what we no longer need for national defense, we get that much more money with which to meet our pressing requirements for combat forces . . . We are getting more defense value out of every appropriated dollar than ever before."

You would think that the author of these proud words would scream like a wounded eagle if some one tried to pry him loose from a few of his precious defense dollars. But the fact is that he permitted the Secretary of Labor, in a decision last week, to eucrhe him out of what may eventually be hundreds of millions of dollars of defense money without even a whimper.

The decision was the establishment of a new minimum wage of \$1.05 an hour for employees in the aircraft industry working on government contracts. In case you missed the story, we'll recount it briefly. Under the Walsh-Healey Public Contracts Act of 1936, the Secretary of Labor is required to set the prevailing minimum wage for industries working on government contracts. The last prevailing rate set for the aircraft industry was fifty cents per hour in 1938. Obviously this was unrealistic in view of today's higher wages. The aircraft industry claimed however, that a \$1.05 figure is also unrealistic; that the actual prevailing minimum wage is between eighty and ninety-five cents per hour. The unions held out for \$1.15.

At any rate, hearings on the subject were held by the Labor Department last year. The Defense Department was urged to protest any change in the minimum wage, for the obvious reason that any change would increase the costs of new aircraft at a time when plane costs were approaching the prohibitive. But Defense had nothing to say; Johnson, proud defender of the taxpayer's dollar, was not willing to buck what was obviously an Administration policy of raising wages in the aircraft industry.

Now, to be fair about it, the new wage minimum is not going to send aircraft costs soaring immediately. Actually, only about two and one half per cent of the workers in the industry were making less than \$1.05; these will be the only persons to get salary raises immediately.

## Seniority Inflates Average

But in the long run it is going to cost a lot of money. Here is one reason: for some time employment in the industry has been static, there have been no mass hirings. Thus, there are a lot of veterans in the industry. Take Citizen A, for instance; he started with Lockheed in 1947 as a sweeper at eighty cents an hour. Being a backward fellow, he's still a sweeper today, but having achieved a certain seniority, he now makes ninety-five cents instead of eighty. Now since there have been so few hirings in the last couple of years, we have several

thousand Citizen A's who have upped their average salaries to ninety-five cents through seniority, when actually the job only calls for eighty cents. It was this inflated average upon which the Labor decision was based.

So if there is any expansion in the aircraft industry, as well there might be under the Mutual Defense Aid Program and the constantly-changing defense requirements of our own country, what happens? Instead of hiring thousands of workers at the eighty-cent level, the industry will be forced to pay \$1.05. It doesn't take too much imagination to figure what a minimum rate increase of thirty per cent will do to plane costs, since labor is 43% of the cost of an airplane.

Or suppose there is a general drop in the national wage index and the aircraft industry remains frozen at the \$1.05 minimum wage. The Aircraft Industries Association, in its presentation last year, offered some estimates as to what it would cost aircraft purchasers (and the Department of Defense is the No. 1 purchaser) if the wage index returned to previous levels: \$50,000,000 a year if it returned to the 1947 level, \$91,000,000 a year if it returned to the 1946 level and \$204,000,000 a year if it returned to the 1941 level. Needless to say, any one of those three sums would represent a sizable chunk out of the money available for aircraft procurement.

## Entering Wedge

But that isn't the entire picture. The new minimum will act as a wedge for a round of wage increases throughout all levels of the industry. Take Citizen B, who has been working as a semi-skilled technician alongside Citizen A at Lockheed, at, say, \$1.20 an hour. Citizen A is suddenly boosted a dime an hour under the minimum wage decision. Citizen B is resentful; he is proud of his semi-skilled status and wants to maintain his salary gap over unskilled Citizen A. So he demands another dime. And on up the line. The aircraft and component industry, or that portion of it which comes under the provisions of the act (airframe plants, engine and propeller plants, parts, accessory, armament and special tool manufacturers, etc.) employs an estimated 400,000 persons and has an annual payroll of well over one billion dollars. Figure for yourself what an industry-wide raise of only 5% would do to plane costs and to the defense budget. Now try 10%; or even 20%, not beyond possibility.

As we said, the effect on the industry will not be immediate. The new minimum wage applies only to government contracts let after July 8 and it will take some time for the effect to be felt.

But it should be obvious that the new minimum wage is going to have quite an effect on airplane costs in the coming years, when the defense dollar is getting tighter and tighter. The Secretary of Labor cannot be criticized harshly for favoring labor; in our form of government he has to, or labor will get a new Secretary. But we think the Secretary of Defense might have said a word or two on the defense implications of this wage raise. Particularly a Secretary who wants to get "more defense value out of every appropriated dollar."

## Industry Personnel

G. T. Willey has been appointed assistant general manager of The Glenn L. Martin Company in addition to his duties as vice president - manufacturing. He has been with Martin since 1929 and has been in aircraft engineering and manufacturing for 32 years.



Willey

L. Martin Company in addition to his duties as vice president - manufacturing. He has been with Martin since 1929 and has been in aircraft engineering and manufacturing for 32 years.

J. R. Clark and Raymond C. Blaylock have been appointed assistant chief engineers of the Chance Vought Aircraft Division of United Aircraft Corp. Clark formerly was chief of the experimental section of the manufacturing department, and Blaylock was chief of design of the engineering department.

Burt C. Monesmith has been appointed manufacturing manager of Lockheed Aircraft Corp., following the resignation of Herbert E. Ryker as vice president of manufacturing. Ryker joined Lockheed five years ago after serving as factory manager of the Douglas Aircraft Co. plant in Tulsa. Jack T. Gray, master scheduling manager, was promoted to the position of assistant to the manufacturing manager, and Harold M. Harrison, production engineer, moved up to Gray's former post.

Ralph Floyd has been promoted to assistant sales manager of the Cessna Aircraft Co., succeeding Derby Frye, who has been placed in charge of the Air Force contracts section of the company.

A. Paul Fonda has been promoted from the sales department of the Fairchild Aircraft Division to the customer relations staff of the Fairchild Engine and Airplane Corp.

## Military Personnel

Maj. Gen. Robert M. Lee will be relieved as commanding general of the Air Force's Tactical Air Command on July 3 to devote full time to directing the air phases of the forthcoming new atomic tests at Eniwetok. He will be replaced in TAC by Maj. Gen. Otto P. Weyland, who has been deputy commandant of the National War College. Maj. Gen. John M. Weikert will replace Weyland.

Maj. Gen. Laurence C. Craigie, commandant of the USAF Institute of Technology at Wright-Patterson AFB will become Chief of Staff, Far East Forces, on August 5. He replaces Maj. Gen. John M. Weikert, who will become commandant of the Air Tactical School, Tyndall AF Base, Florida. Maj. Gen. Grandison Gardner, president of the Air Force Base Development Board, will take over the Institute of Technology.

## PRODUCTION SPOTLIGHT

**Anti-Sub Aircraft:** The Navy's emphasis on development of new anti-submarine equipment was pointed up within the last fortnight as Grumman Aircraft Engineering Corp. and Bell Aircraft Corp. were declared the winners in competitions for two new anti-sub aircraft.

Grumman won the competition for a carrier-based attack plane with a 21,000-pound design which will be powered by two Wright R-1820 engines and will receive a contract for two experimental models. Intended for operation from "Jeep," or small escort carriers, the plane will have the latest in sub detection and destruction equipment. No designation has been given the design as yet, but it will probably be the XA2F-1.

Second place in the competition went to Curtiss-Wright Corp., which also submitted a 21,000-pound twin-engine design. C-W will get a contract for completion of a detailed engineering study, but the actual construction of prototypes of this design was not authorized.

Bell took first prize in the helicopter category, beating out nine other manufacturers who submitted a total of 17 designs. Bell abandoned its conventional single-rotor design pattern for this competition and submitted a tandem-rotor design. The tandem design is believed to have been a major factor in the Bell victory; the Navy's success with the Piasecki HUP and HRP helicopters has made it tandem conscious.

The Bell tandem will be a 13,000-pound plane which will be powered by a Pratt & Whitney R-2800 2,300-horsepower engine. The Navy will award an initial experimental contract for three planes at a cost of \$4,400,000; money will also be reserved for a future production order for anti-sub helicopters, but other competitors in the field will also be considered for this order. The other manufacturers who submitted designs in the helicopter competition were Piasecki, Sikorsky, Hughes, McDonnell, Kellett, Hiller, Curtiss-Wright, Kaman and Gyrodyne.

**2,713 in 1950:** Military plane manufacturers will deliver a total of 2,713 planes to the Air Force and Navy during the calendar year 1950, according to recent Congressional testimony by Defense Secretary Louis Johnson. The Air Force will get 1,732 planes and the Navy 981 this year. This is not to be confused with planes ordered during fiscal 1950, which will be delivered some time later. The Air Force ordered 1,250 planes, the Navy 768 in fiscal 1950.

Johnson said the 1950 deliveries will require the expenditure of \$1,700,000,000 out of previous appropriations. Cash payments lag from one to three years behind the Congressional authorization to spend the money.

In 1951, Johnson said, deliveries are estimated at 2,297 planes—1,383 for the Air Force and 914 for the Navy. The Air Force delivery figure coincides exactly with the number of planes to be ordered in fiscal 1951; the Navy will order 817 planes in 1951. The 1951 deliveries will require the cash expenditure of \$2,200,000,000.

**Deliveries:** Lockheed Aircraft Corp. has delivered the first two production models of the F-94, all-weather version of the F-80, to the Air Force. The F-94's will be the first jets equipped with afterburners to go into regular USAF service . . . Pratt & Whitney Aircraft Division has delivered its 5,000th R-4360 Wasp Major engine. No. 5,000 went to Fairchild Aircraft Division for installation in a C-119 Packet . . . Piasecki Helicopter Corp. has completed the fuselages of the first two Navy HUP-1 seven-place helicopters and is now working on Nos. 3 to 7. Roll-out date for No. 1 is July 14 . . . Sikorsky Aircraft Division has scheduled delivery of the first Navy HO4S-1 anti-submarine helicopters for July. The HO4S-1 is a modification of the Air Force's 10-passenger H-19 rescue helicopter, two of which have now been delivered to the USAF at Pope AFB, N. C. The Air Force has five on order, the Navy 10.

**Slim Year:** Lightplane manufacturers can look for slim pickings in fiscal 1951 as far as military liaison plane business is concerned, recent Congressional testimony reveals. W. J. McNeil, Assistant Secretary of Defense, disclosed that the Army's 1951 aircraft procurement program calls for the purchase of only 21 aircraft, a decrease of 252 planes from the 1950 program. The Air Force might buy a few, but not many.

—J.J.H.

# BLASTING BEAUTY!



Sleek, high-speed, powerful—the Martin XB-51 is the Air Force's first postwar plane specifically designed for supporting our ground forces.

Blasting enemy supply lines and installations to help keep our ground forces rolling—that's one of the roles the new Martin XB-51 is designed to play in America's preparedness program! It's a teamwork bomber—versatile, powerful, super-fast, highly maneuverable, designed to be capable of operating from combat area fields. Its lines are clean and graceful, yet radically different. A unique power plant arrangement includes two jets mounted on fuselage pylons and a third in the tail. Drastically sweptback wings, a T-shaped tail and tandem landing gear—plus many other features still classified under military security regulations—make it as modern as tomorrow!

Like all Martin developments, the XB-51 is the product of a highly skilled engineering team. Electronic, aerodynamic, metallurgy research, servo-mechanism studies—all play their parts in the technical leadership Martin offers its customers today. All play their parts as Martin extends research frontiers in advanced design aircraft, rocketry, jet propulsion, supersonic missiles and other far-reaching fields! THE GLENN L. MARTIN COMPANY, Baltimore 3, Maryland.

**Martin**  
AIRCRAFT  
Builders of Dependable Aircraft Since 1909

**Manufacturers of:** Military aircraft • Martin airliners • Guided missiles • Rockets • Electronic fire control and radar systems • Precision testing instruments • Developers and Licensees of: Mareng fuel tanks (to U. S. Rubber Co.) • Marform metal-forming (to Hydropress, Inc.) • Honeycomb construction material (to U. S. Plywood Corp. and Aircraft Die Cutters) • Structural adhesives (to U. S. Plywood Corp. and Bloomingdale Rubber Co.) • Permanent fabric flame-proofing (to E. I. duPont de Nemours & Co.) • Hydraulic automotive and aircraft brake Leaders in Building Air Power to Guard the Peace, Air Transport to Serve It.



Powered for faster starts, the Martin XB-51 is designed to have great versatility for operations to and from smaller combat area fields. For landings, the new Martin bomber has a parachute stowed aft which may be released



at the pilot's discretion for more rapid deceleration.

carrying  
story!

# ! Wing air power's to America \*

## air power

Martin advertising develops for millions of alert American readers. Attention-getting advertisements like this reach the general public and business circles in *Time*, *Newsweek* and *Business Week* . . . explain aviation's important role in our country's preparedness program and in the development of travel facilities. "Martin Air Memos" bring news of latest developments to the men and women who write and edit the news through *Editor and Publisher*, *American Press* and *Publisher's Auxiliary*.

## engineering

has become food for discussion even among laymen in this highly technical age. So this advertising also highlights the manner in which Martin systems engineering is meeting the challenge of tremendously complicated air power needs. Today, the Martin engineering staff is designing aircraft and missiles as integrated air-borne systems, not merely as flying vehicles. Martin design work embodies electronic flight and navigational controls and military armament or passenger facilities, as well as airframe and power plant. And the complete development of the aircraft or missile is so scheduled that the end product represents a completely coordinated system.

A well-informed public . . . fully aware of preparedness needs, problems and measures . . . is one of the finest safeguards for peace. Martin advertising helps spread the facts!

THE GLENN L. MARTIN COMPANY, Baltimore 3, Maryland.

# Martin AIRCRAFT

Builders of Dependable



Aircraft Since 1909

# American Aviation Flight Assessment . . .

## 2--Ryan's Navion Super 260

By RICHARD G. WORCESTER

(Editors' Note: This is the second in a series of reports on flight characteristics of current aircraft models by Design-Engineering Editor R. G. Worcester. The first, on Lockheed's Shooting Star, appeared in the May 1 issue.)

**W**HEN RYAN invited us to fly the Navion Super 260 at Washington National Airport the combination of inducements would have tempted us many times the distance, because of all the dozens of lightplanes available, this one—with its fighter ancestry—has the most intriguing pedigree.

Nearly 2,000 Navions have been built so far of which the last 30 odd are powered by the geared 260-hp. Lycoming flat-six in place of the ungeared 205-hp. Continental flat-six. Performance has been improved all around and at 65% power the gain amounts to about 16 mph true airspeed. Nobody will disagree with the way Ryan have chosen to absorb the increased output by a larger propeller turning more slowly (11 inches greater diameter has been possible within the CAA ground clearance requirements). Instead of passing the engine's 2,100 rpm to the propeller, 2,600 rpm of the Lycoming now means 1,670 at the propeller when cruising.

Greater fuel consumption called for an increased fuel tankage of 20 gallons making 60 in all. There is better soundproofing, air conditioning and

upholstery but otherwise, apart from the new f.a.f. price of \$13,985 the aircraft remains the same.

### Cockpit and View

Ryan recognizes that the dogmatic opinions of private owners vary widely over what constitutes essential instruments by making the front panel easily detachable. They pragmatically offer a standard instrument layout but, in effect, leave it to the operator to put his pet instrument in his own place. Ryan, however, ought to encourage the private owner to use a horizon.

The cockpit seating and general layout is well arranged and everything falls to hand easily, working in a logical sense. In a few minor respects Ryan may have missed an opportunity. A segment of the elevator trim wheel protrudes from the front panel and in hot weather with sticky hands it is a bit of a chore to operate. Another point is that instruments at the other end of the panel are not properly readable as they are sunk too far. This is being hypercritical but the Navion is excellent enough to be judged by the severest standards.

View over the nose is probably the single most important aspect about any cockpit windshield and seating geometry. The Grumman Avenger is the only single piston-engined aircraft in any class we can recall off-hand with a better view. The angle downwards in the Navion is around 13° with perhaps 15° upwards. Azi-

muth view is unrestricted except for the canopy pillars.

The starter button is on the firewall beyond the rudder pedals. Women or short-legged pilots may have to pull their seats up to reach it.

### Takeoff and Taxiing

Taxiing with the pedal-operated brakes is childishly simple and a parking brake between the front seats on the panel is instantly available for greater braking power. There is no swing on takeoff and at the point of pull-off the horizon lies about one-fifth of the distance from the bottom of the windshield. All three controls are responsive at 50 mph indicated airspeed and the takeoff at this speed is clean.

The wheels retract in 11 seconds and flaps operate at about 10°/sec. The flap angle for takeoff is 21° and maximum angle is 42°. A rate of climb of 1,200 ft./sec. is claimed by the makers and indicated climbs of 2,000 ft./min. can be made for short periods. A hands-off climb at 1,000 ft./min. indicated can be sustained using 26" Hg. and 2,900 rpm. at 100 mph. IAS and, stick free, the aircraft is longitudinally stable when climbing. Cylinder head temperature in this climb is a needle's width short of the placard 200°C.

In the air the rudder is too light and the other two controls relatively too heavy for harmony but the three controls are pleasant to operate and amply responsive. The rudder is, indeed, surprisingly light at all speeds—almost spongy in its feel—but precise in its directional effect. A rate of yaw over 20°/sec. can be made within a lateral change of 5°. Under all conditions the Navion has positive directional stability.

### Longitudinal Stability

Longitudinally there is positive stick-free stability and the gradient of elevator control force is about 16 lb./g. with two people aboard and 160 mph.IAS at 5,000 ft. so the aircraft cannot be overstressed with one hand (the CAA asks for a yield factor of 3.5 and ultimate of 1.5 for this size of normal category airplane). A 10% speed increase at 150 mph.IAS, stick-free, causes the nose to rise to 120 mph., fall to its original figure only; rise to 140 mph., and, on the third phugoid settles back to within 5 mph. of the original speed.

Laterally, the aircraft we flew was, for some reason, neutrally stable at





**Turboprop Prop—Hamilton Standard**

Division of United Aircraft Corp. developed this new, 14-foot, eight-bladed contra-rotating propeller for use on the Navy's large turboprop engines. The propeller has completed 400 hours of test work in Hamilton Standard's test cells and will get further testing by the Navy. For test purposes a Pratt & Whitney 3,500 horsepower Wasp Major engine was used, but the propeller is designed for use with turbine engines of more than 5,000 horsepower.

cruising speed. This may have been due to static friction forces which seemed higher than they need be. (CAA calls for positive lateral stability at the placard speed.) The rate of roll is high and about 80°/sec. can be sustained all the way around without losing height or speed if started at 150 mph.IAS at 5,000 ft. With the nose held well up aileron action alone is sufficient.

Adding up the stick forces, we can say that in our view the Navion can complete transition of maneuver extremes within sustained stick forces of 5 lb. on the aileron, 10 lb. on the elevator, and nothing approaching the 20 lb. maximum requirement is needed on the rudder.

#### Level-Flight Speeds

The following level cruising speed recordings are not a series of spot readings, but the needles seemed glued to their places and the aircraft is apparently able to hold the performance indefinitely. At 60% power (20° and 2,400 rpm.) the speed was 146 mph.IAS or 158 mph.TAS at 5,000 ft. and 47° F. (2 mph.TAS better than the CAA figures).

At 75% power (24° and 2,600 rpm.) it produced 154 mph.IAS or 168 mph.TAS at 5,000 feet and 52° F. The cylinder head temperature had settled at 170° C., shutters closed. At sea level 60% power gave 144 mph.IAS or 145 mph.TAS—which agrees with CAA

# Design Trends

By Richard G. Worcester



IN THIS uncertain period of transition to turbines there is a growing tendency for the aviation community to be sidetracked by non-essentials. This inherent reciprocity—or desire to overlook nothing—finds expression in people, one after another, suggesting new turbine hazards apparently for the pleasure of demolishing them. Then sectional interests protest that these problems are not so simple and before we know what has happened trivial matters have assumed a major importance.

Many problems can be fairly said to lie in this category—the question of runway deterioration from turbo-fuels has probably been greatly exaggerated. So also has the effect of humidity on performance and a third example is the theoretically explosive mixture in gasoline and kerosene tanks. With regularity every one of these three old ladies has put in an appearance during technical discussions to my certain knowledge since 1945. We are now no nearer the solution of non-existent problems than we were half a decade ago. The situation calls for IATA (which has taken the initiative on a wide range of problems already) or ICAO or somebody like Ed Warner or Peter Masefield to work out the relative priority of turbine transport problems and so help everyone to get into perspective the whole vista of the turbine-fifties.

A new aspect of the traditional tank purging system is the "anticipation" of a gasoline explosion by using a trigger, sensitive to very small changes in pressure within the tank and coupled to an extremely rapid tank purging circuit able to smother the explosion before it develops. The disadvantage of the idea (which is being explored in the U. S. and Britain) is that changes in pressure sufficient to set the equipment in action can result from comparatively innocuous causes, thus unnecessarily inhibiting the fuel and robbing the pilot of its use. Walter Kidde and Cornell University are pioneers in the tank purging business; Janitrol is using a small combustion heater to furnish oxygen-free gas.

Is not this business of wing-tip tanks for jet aircraft getting out of hand? Wing-tip tanks were justified in the early days when manufacturers had little or no experience of carrying very large fuel loads around the CG of a small aircraft. Wing-tip tanks have also had the effect of extending the versatility and service life of an aircraft already in squadron use. But to use wing-tip tanks on new design in the prototype stage seems another matter. Tip tanks are a valuable card up the designer's sleeve but is it wise to play your ace at the beginning? The tip tanks may increase the effective aspect ratio, they may increase the structural strength of the aircraft due to the favorable dead weight of the fuel and with good design they can improve the aileron effectiveness. But they are expensive objects to throw away each time, they do cause parasite drag, they mean that another place must be found for external bombs, they can restrict the azimuth view, they can cause an increased rotational moment of inertia, they usually constitute the weak link from a speed and compressibility standpoint and the problem of stowing drop tanks aboard a carrier is a perennial Navy nightmare.

Reports on the supersonic prop-jet or turbo-ducted fan continue to underline the greater flexibility of this engine layout as compared with any turbojet so far officially announced. Advanced elements of the propeller industry have, we suspect, reached about  $M 1.3$  helical speed using a single rotation eight-blade layout with a blade thickness-chord ratio of 2%, and made of solid titanium. Dual rotation blades have been tried but the single rotation seems to give the smoothest thrust at high top speeds. An efficiency of 80% is recorded in the range up to  $M .8$  and practical research indicates that an efficiency of 50% can be retained up to  $M 1.2$ .

# Shooting a bird...

## IN THE AIR AGE

**T**HIS IS "shooting a bird" at the U. S. Naval Air Missile Test Center, Point Mugu, California.

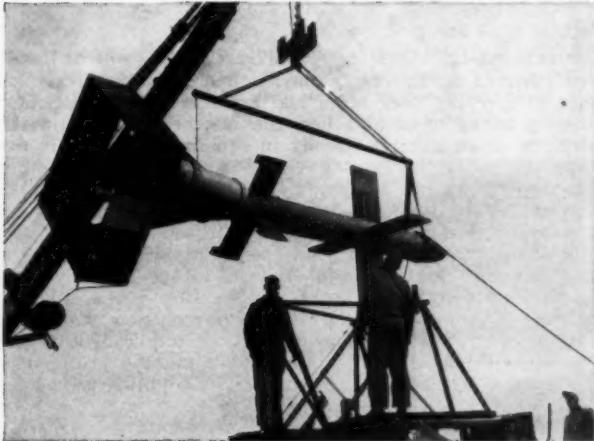
The "shoot" is the launching of a missile, while the "bird", in this particular case, is the Fairchild CTV-N-9a guided missile.

In a matter of seconds the missile is hurled high into the atmosphere with a deafening roar, propelled by its reaction type motors and auxiliary booster. Separation of the booster occurs as the missile speeds higher and higher into space, stabilized and controlled by the "intelligence" of its electronic guidance systems.

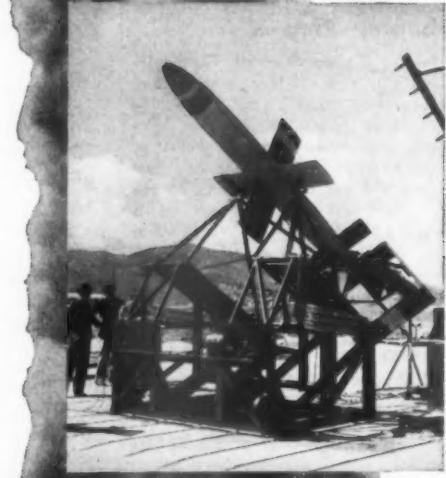
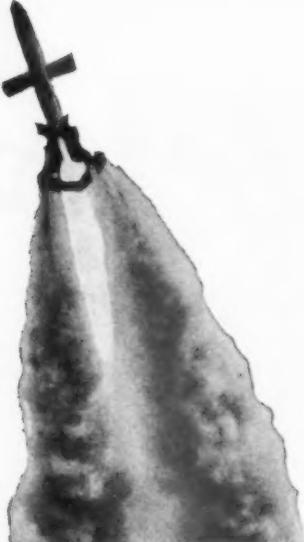
Soon the launching crews and ground observers no longer see the missile... but its path is being carefully plotted as it hurls toward its target... now under its own homing control.

This "shooting a bird" is but one phase of the Lark project. It is an operation requiring split-hair timing and perfect coordination. It is the result of teamwork between the Bureau of Aeronautics, Navy Department, the Naval Research Laboratory and Fairchild engineers and represents a combination of the best in aerodynamic design, electronic controls and precision manufacturing.

Here is another example of a Fairchild *first* and of "shooting a bird"... in the Air Age.



DEPT. OF DEFENSE  
PHOTOS



ENGINE AND AIRPLANE CORPORATION  
**FAIRCHILD**  
*Guided Missiles Division*  
FARMINGDALE, LONG ISLAND, N. Y.

findings (the position error is practically nil throughout the speed range).

The Navion has a vane-induced root stall and, flaps up, buffeting starts at about 60 mph.IAS. As speed is reduced, using full power at an angle of 20°, there is ultimately moderate to violent buffeting with large airspeed indicator needle fluctuation up to plus or minus 40 mph. but no flow breakaway. Full aileron will produce about 20° of lateral change.

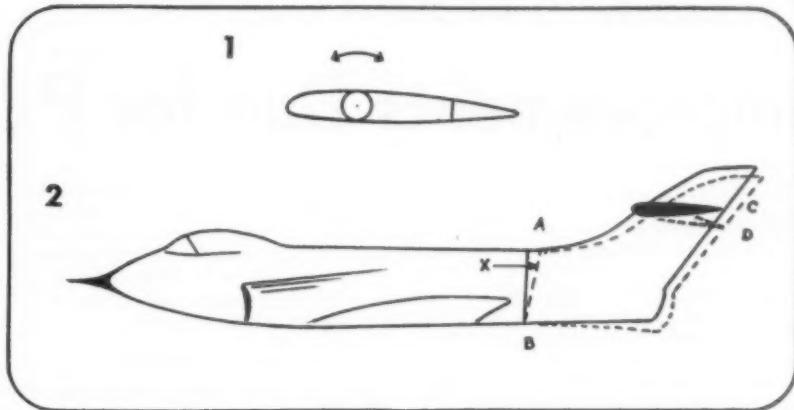
Full power, full back elevator and full aileron can be applied without a spin or inversion. This proved to be quite a remarkable experience if performed in cold blood. It sounds fantastic but in cloud such a situation can leap on the rusty instrument flier (especially without a horizon) and so the built-in safety of the Navion does have some real meaning.

### Built-In Safety

If full rudder is also applied a spin will develop but the angle of attack becomes less and this seems to pull the aircraft out automatically in less than a turn. Thus the private owner can be sure that so long as he keeps his feet on the floor, and the rudder is controlled only by its aileron interconnection, no spin can start.

With flaps down the stall causes slight snatching at the controls, power off, but it is practically impossible to stall. Gentle—and, indeed sharp—turns can be made at 50 mph.IAS with power on. The nose is unnaturally high and the horizon is almost on the bottom of the windshield. If the nose is then raised, there is buffeting but again no flow breakaway and some aileron control is retained.

The maximum speed for flap operation is 100 mph.IAS and the wheels go down in four seconds. The flaps



going down cause a slight nose down trim change which can, and should, be trimmed out with three tugs at the wheel. In a power-off approach the horizon rises almost to the top of the windshield line and, if a turn is made, the horizon disappears above the roof line.

Power-off, the descent is steep and a power-on approach at 70 mph.IAS is the most comfortable. When holding off the elevator has plenty of bite down to 50 mph.IAS and the aircraft is absurdly easy and entirely conventional in its landing habit.

Adding it up, we consider the Navion is essentially a likeable and nimble personal aircraft with particularly gentle and viceless characteristics at the speed extremes. The controls are responsive through the speed range and liberties can be taken with the aircraft which must be experienced to be appreciated. The disadvantages were limited only to neutral lateral stability which may have the explanation suggested and some minor cockpit features.

### Hinged Fuselage Trend

It is becoming clear that the vital agency to cope with the enormous loads on the stabilizer in transonic flight is the electrically operated actuator. Very rapid irreversible alteration of the tail incidence has long been the accepted way of doing this but novelty lies in the choice of the hinge line. The usual way is to pivot the stabilizer around its central axis (like the Skyrocket, English Electric Canberra, etc.) but an alternative method which is finding favor on both sides of the Atlantic is to hinge the rear fuselage at about the point X (above) so that when the actuator moves the tail at A this is translated into the incidence change represented by the angle between C and D. The advantages of this method are that the simple stresses in the push-pull action are easier to calculate and the actuator itself, which is quite bulky, can be stowed in the fuselage where there is plenty of space. As we go to press we find that a Lockheed publication has anticipated us; in their "Lockheed in the 1950's" they depict a hinged stabilizer as used on the F-90. Their hinge, however, runs from about the point A (above) diagonally aft to just above the jet pipe.



**B-45 Tip Tanks**—The added fuel capacity of about 1,600 gallons in the two tip tanks give the North American B-45 an extra endurance of about 1.7 hours at altitude. Yawmeters are attached to this experimental prototype and during dropping tests it is established that the tail vanes successfully hold the tank away from the wing tip structure while jettisoning. The tanks must pull the mach number of .77 down considerably.

**Stratocruiser Powerplant . . .**

# Improvements Due for P&W R-4360

By WILLIAM D. PERREAU

**I**MPROVEMENTS in the Pratt & Whitney R-4360 engines now being planned show promise of providing greater engine reliability and service life and of improving the performance of the Boeing Stratocruisers which they power. Possibly the most extensive of these changes centers around an attempt to lower the temperature of the combustion and exhaust gases.

Since the commercial Stratocruiser service was inaugurated the airlines have been plagued by engine troubles—troubles representative of early commercial service with any new engine. These manifested themselves in many ways but airline studies indicated that the high combustion and exhaust temperatures were major contributors to the problem.

During the coming summer months the Boeing operators will service test the first of four engines especially modified by Pratt and Whitney to provide the lower temperatures. Primarily this has been attained by setting the ignition system for 28 degrees spark advance during cruising and a change in the fuel-air ratio.

**High-Temperature Effects**

The high combustion temperatures had been reflected in flaking and pitting of the exhaust valve stems, corrosion of the valve head and dome and scaling on the crown. The modified engine will have coated inconel exhaust valves with an internally choked sodium cavity. The exhaust valve guides will be made of composite cast iron and bronze and oil seal rings will be used on the valve stems. Silichrome exhaust valve seats will also be used.

A redesigned rocker-box housing with greater area will provide improved cooling. This will combine with a system of flooding the rocker box with oil to reduce operating temperatures to a minimum.

The effect of these changes will be controlled to some extent by the final decision on fuel-air operating ratios. Present-day practice is to use a .065 ratio but during exhaustive factory tests, in which the new modifications were arrived at, the mixture strengths were kept at .060. P&W used this ratio to subject the valves and other combustion chamber parts to the most strenuous conditions possible.

At least one of the Boeing operators

would like to run the test engines at this fuel-air mixture. Present indications are that two of the four engines under test will use 28 degrees spark advance with .065 mixtures and next two the same spark advance for cruise but a .060 mixture.

**Full-Scale Tests**

As indicated above, these are not arbitrary changes. Working in cooperation with the airlines, P&W ran single-cylinder tests with the R-4360 components to investigate every avenue through which lower temperatures could be obtained. One of the means investigated, but not to be incorporated in the first test engines, was redesigned valve cams which delayed exhaust valve opening by six degrees. Later a complete R-4360 was built up and run through a rigid 500-hour airline cycle test.

An insight into the effect of these changes can be had by realizing that the combination of use of 25-degree spark advance in cruising with a .065 mixture is expected to reduce exhaust gas temperatures by 50°-60° F. and bring about 1½% reduction in

fuel consumption. As a result of the tests mentioned above, P&W has authorized all R-4360 operators to use 25-degree spark advance and since .065 is the normal cruise fuel-air ratio this improvement can be expected on present service engines.

The modified engines using 28 degrees spark advance in cruise (this will require two-position spark controls being installed in the cockpit) and still maintaining fuel-air ratios of .065 will save close to 2% in fuel consumption and reduce exhaust gas temperatures by as much as 75 degrees. In turn the engines using 28 degrees and a .060 fuel-air ratio are expected to save up to 4% in cruising fuel consumption and reduce temperatures by over 100 degrees.

**Tangible Results**

What will the tangible benefits of these reduced temperatures be? Troubles with the General Electric cruise turbos have been quite severe. The most critical factor has been breakage of turbine blades caused by fatigue at the current high operating temperatures. General Electric



**Kaman Explorer**—Kaman Aircraft Corp. has added a plastic "bubble" cabin to its earlier open-air design, as shown in this photo of the K-225 Explorer. Approved by the Civil Aeronautics Administration for commercial use, the Explorer is designed primarily for aerial survey work and personnel and cargo transport. The tandem seating arrangement with dual controls permits the pilot to fly the plane from the rear seat while the observer rides up front, where visibility is unrestricted. Power plant for the Explorer is a Lycoming 225-horsepower engine.

has indicated that turbine life could be extended as much as two or three times present levels by reducing exhaust temperatures by 50-60 degrees.

Similar improvements could be expected in exhaust valve life, failures of which have contributed to numerous unscheduled engine removals in the past. This will mean that the present limit of about 450 hours on these parts will be extended, favorably affecting overhaul times.

While a reduction in exhaust gas temperatures will go far in relieving turbine troubles, General Electric has engineered several improvements into the turbines which will provide additional benefits. Typical of these improvements has been the development of a turbine wheel in which the buckets can be changed in the field thus improving service life. Similarly, GE is experimenting with the production of buckets of higher and more uniform carbon content.

Working with Boeing, General Electric has studied the effect of side loads on the turbine and provided some relief by using more flexible slip joints in the ducting.

### More Changes

By use of a stainless steel shell, increasing the thickness of the material in the nozzle box and diaphragm and provision of reinforced baffle supports the remainder of the turbo problems should be minimized. Transverse slip joints on the exhaust collector rings, a point which gave considerable trouble in the early collectors, have been provided with a new Ryan clamp with considerable improvement in service life.

Ryan has also been working with Pan American to ease the erosion and scaling which has generally limited the life of the collector ring to one engine run. This has been largely due to the high operating temperatures and bromide from the exhaust gases. Ryan has manufactured a number of test sections of improved material.

In the investigation of materials which might be expected to improve collector ring life certain header and collector ring sections were sent to the Al-Fin Division of Fairchild. There they were to be coated with aluminum and placed in service test engines.

While these have been the major problems, many minor service troubles, many of which snowballed in the course of engine life, have also been subject to investigation and correction. Ignition timing has been thrown off by excessive wear of the breaker cam follower and by wear in the gears and linkage which permitted additional lagging. Closer inspections and some redesign have been found necessary.

Also, oil seal leaks in the magnetos

## TECHNICAL NEWS DIGEST

- **Delivery of United Air Lines' supplemental order** of five DC-6's was to have been completed by the Douglas Aircraft Co. on June 30, increasing United's DC-6 fleet to 44. Deliveries on the six DC-6B's now on order for UAL are not scheduled to start until early 1951.

- **The airport terminal, radio station and other facilities** owned by Pan American World Airways at Asuncion, Paraguay, have been seized by the government of that country. PAA does not now serve Paraguay and Panair do Brasil has been operating the facilities. Braniff Airways, which also has been using the radio station, has asked Panair to continue its operation until it can complete installation of its own station.

- **Aero Maritime Division of Chargeurs Reunis**, a French non-scheduled air carrier, will buy four Douglas DC-4's and 22 spare Pratt & Whitney engines from Peruvian International Airways for use on service between metropolitan France and French overseas territories. The Economic Cooperation Administration will make a loan of \$850,000 toward financing the project. Total cost will be \$993,000.

- **Pan American World Airways will have versatile seating arrangements** on its extra-fare Stratocruiser service between New York and Buenos Aires. Seats are mounted on tracks extending the length of the cabin, and for night operations 10 seats will be removed, a 30-minute job. The remaining seats, sliding along the tracks, are then spaced a greater distance apart and become sleeperettes.

- **North American Aviation has ordered 122 Zero Readers** from Sperry Gyroscope Co. for installation in the all-weather version of the F-95A Sabre. The contract follows more than eight months of tests and evaluation of earlier models. Initial deliveries are scheduled during the summer months.

- **Allison Radar Corp. has been formed** to handle worldwide sales and distribution of the Allison navigational radar equipment. This includes several models of airborne radar weighing from 58 to 63 pounds. Offices are located at 11 West 42nd St., New York 18, N. Y.

- **"For leadership in development of the first American design of a turbo-jet powerplant for aviation service,"** the American Society of Mechanical Engineers has awarded Reinout P. Kroon The Spirit of St. Louis Medal. Kroon is engineering manager of the aviation gas turbine division of Westinghouse Electric Corp.

- **The Texas Company has announced a new low-temperature aircraft lubricating grease** to meet Army-Navy requirements of AN-G-25. Known as Texaco Uni-Temp Grease, the new product is recommended for all aircraft ball, roller and needle bearings operating in the minus 65° F. to plus 250° temperature range.

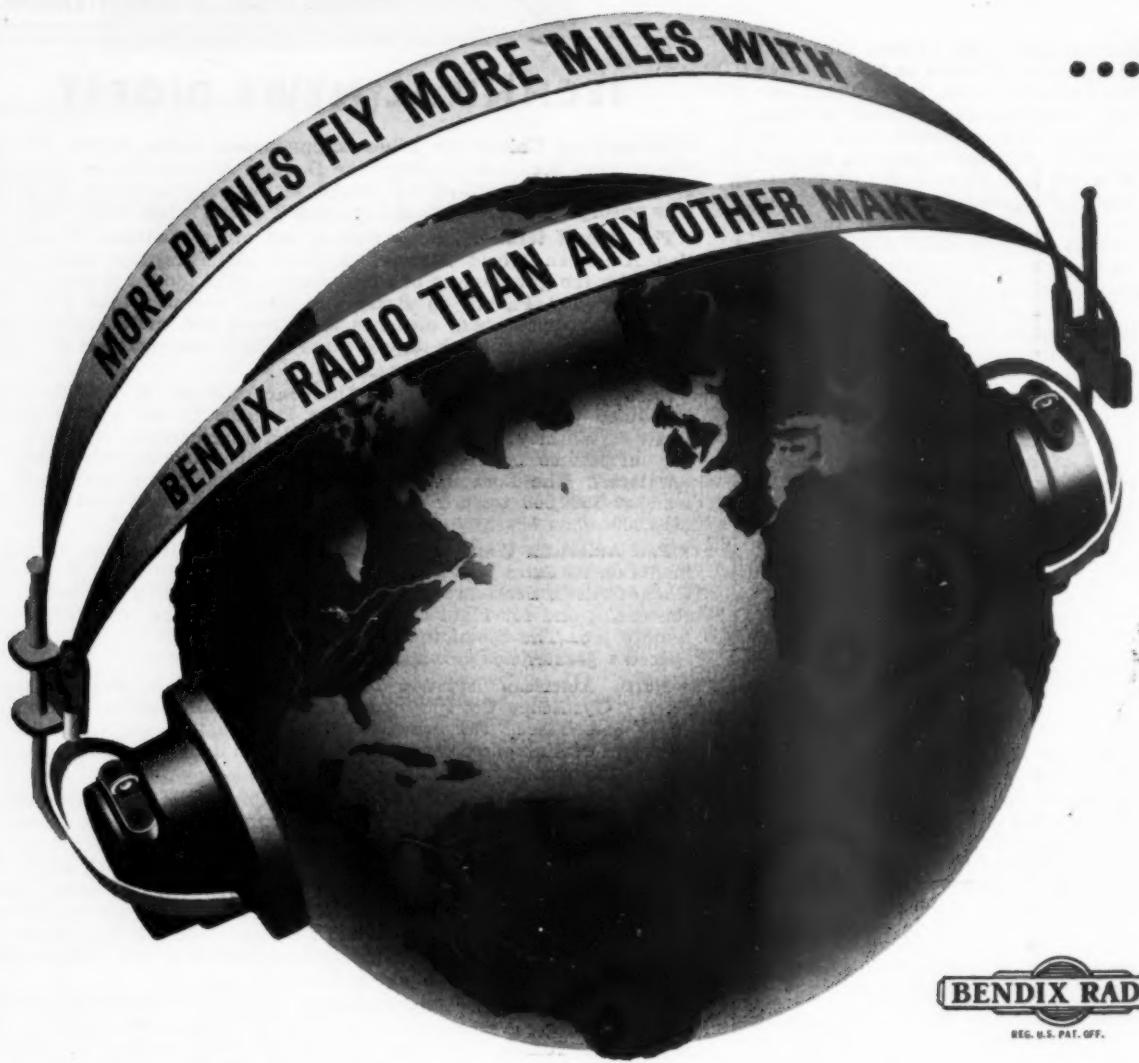
- **Seven sets of crosswind landing gear wheels** have been installed on T-6 "Texan" trainers by the Goodyear Tire and Rubber Co. for the USAF. The T-6's will be used in USAF pilot training to evaluate the new type gears, the first to be designed specifically for military aircraft.

- **George Haldeman, CAA's Chief of the Aircraft Division,** has returned from England where he flew the de Havilland Comet, Britain's four-jet turbine-powered transport.

- **CAA has announced a policy calling** for a reduction in the number of intermediate airfields and airways beacons. Intermediate field spacing will be based on requirement for a lighted one every 200 miles except in rough terrain where one every 100 miles will be maintained. Beacons which mark airports and hazards or define a point on an airway in mountainous terrain will be retained.

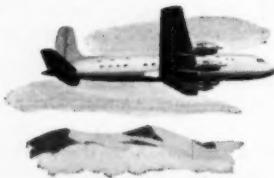
- **Two Avro Canada Limited engineers**, L. C. Secord and Winnett Boyd, have designed a system which prevents hydrogen peroxide from freezing when it is being used as fuel for a starting motor. The hydrogen is used in association with certain jet engines in operating the starters.

- **AiResearch Aviation Service Co.**, Los Angeles, Calif., has contracted to restyle four Lockheed Lodestars for executive use. In addition the single plane recently completed for La Brea Securities Co., AAS has contracts with Likens & Foster Co. of Oklahoma, Esso-Standard Oil Co. of N. J., and Food Machinery Co. of Calif.



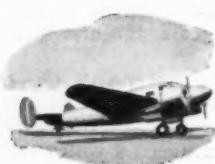
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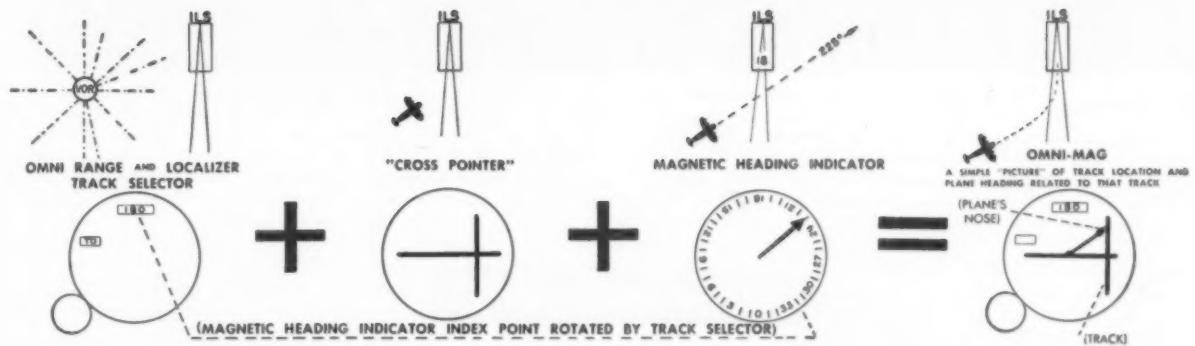
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In the present defense program, Bendix Radio is engaged in helping to find answers to completely new problems. Bendix Radio builds equipment for America's newest Air Force planes.

# Bendix Radios

# Continuing a Tradition of Leadership Bendix Radio Presents the

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GIVING THE PILOT ONE INSTRUMENT, ONE CONTINUOUS PICTURE OF HIS HEADING, COURSE, RECIPROCALS, WIND DRIFT AND GLIDE PATH!

Now, Bendix Radio's new OMNI-MAG enables the pilot to fly orientation, airway navigation and landing approach problems with a minimum of instrument cross-checking and difficult mathematical calculations . . . the pilot literally flies the OMNI-MAG pointer, always heading it as he would the nose of his plane to intercept or maintain the desired track. The "picture" presentation is achieved without mysterious "black-boxes" or electronic tricks. All that has been added to standard instrumentation is one simple "synchro", a common electrical device supporting the OMNI-MAG heading pointer and repeating the indication of a remote magnetic compass. But, *simplicity* isn't its only advantage. The specialists at Bendix Radio also kept *economy* in mind. All electrical characteristics were kept standard . . . the OMNI-MAG, therefore, operates in conjunction with ARINC standard equipment already in use or planned for future installation. Thus, the OMNI-MAG is the logical choice for both military and commercial aircraft, joining the long line of accurate, dependable equipment that has made Bendix Radio famous all over the world.



\*OMNI-range, MAG-netic and ILS Indicator

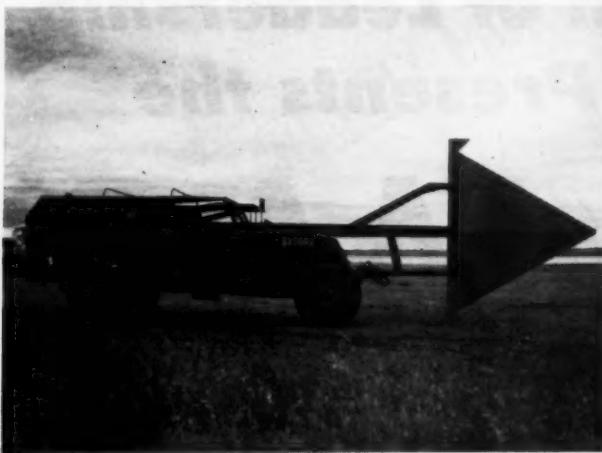
VHF Transmitters • H. F. Transmitters  
Radio Control Panels • Antennas • Indicators  
Automatic Radio Compasses • Marker  
Beacon Receivers • Announcing Systems  
VHF Communication and Navigation  
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Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, New York



**Can Opener**—This king-size can opener was designed by Thomas B. Honeyman, a mechanical engineer in Australia, as an emergency means of extricating passengers trapped in crashed airplanes. During tests at the Point Cook Air Force Base in Melbourne, the armored car made quick work of cutting the tail off of this airplane. The blade is 6 ft., 6 in. wide and has hardened steel edges. The cutting blade is attached to



the armored car by a steel frame. Most of the Australian airlines use Douglas DC-3's and this unit was specifically designed for use on this type aircraft. The plans call for the operator cutting the plane's tail off at a point just aft of the rearmost passenger seats. Operating crews would wear asbestos suits and be able to carry on rescue operations once access was gained with the mobile can opener.

associated with lower banks of cylinders have caused failures. Corrosion in the magnetos is expected to be relieved by an improved vent bleed and pressurizing of inlet vents.

### Rear Case Failures

The high number of rear cases (accessory cases) found cracked during overhauls, and occasionally during service, were tracked down by Pan American and Pratt & Whitney. Tests showed the stress levels at engine rpm above 2,300 contributed to these failures and climb power settings have generally been modified to reflect this new knowledge. By the use of a beefed-up magnesium rear case or a completely new aluminum one, this is expected to be circumvented but with a weight penalty of approximately 50 pounds.

Other improvements underway include redesigned pistons, shot-peened master-rods which will minimize cracking, an improved valve tappet roller, redesigned master-rod bearings, new rocker-box drain lines and seals to accompany the redesigned rocker box set-up, beefed-up torque-meter lines and fittings, and re-operated reduction gearing which is expected to correct teeth spalling now existing due to insufficient back-lash.

Encouraging improvements are underway but it's not a short-term project. Indications are that service tests on the four test engines will not be completed until the end of the year. It would probably take some 18 months to complete a changeover to any redesigned rear case. Many of the operations must be accomplished in overhaul and others are still to be proved in additional service tests.

### AMONG THE SUPPLIERS

**Watson E. Richards** has been elected executive vice president of Atlantic

**Air Aviation Corp.**, Teterboro, N. J. . .

**The Safe Flight Instrument Corp.** has moved its plant and office facilities from 21 Russell St. to enlarged quarters at 4 Water St., White Plains, N. Y. . . **Bendix Aviation Corp.**, Baltimore, Md., has appointed **Louvan E. Wood** chief engineer of the Friez Instrument Division, producers of scientific weather recording equipment.

**C. E. Mead** has been named vice president of **Lear, Inc.**, Grand Rapids, Mich. . . **The Glidden Co.**, of Cleveland, Ohio, has appointed **Aviquipo, Inc.**, as distributor of the company's "Glidair" aircraft finishes in England, France, Portugal, India, South Africa, Australia, Thailand and six South American countries.

**The DeVilbiss Co.** of Toledo, Ohio, manufacturers of air compressor outfitts, spray painting equipment and atomizers, will soon establish a modern plant in Somerset, Pa. . . **George H. Selvin** has been named chief engineer in charge of standards and engineering sales for the **Nutt-Shel Co.** of Los Angeles, Calif. . . **Charles J. Briody, Jr.**, formerly with Brookhaven National Laboratory, has joined **Airborne Instruments Laboratory**, Mineola, N. Y., as supervisor of technical services.

The new firm of **Vosler Associates**, headed by **Kenneth D. Vosler**, has opened offices at 100-05 Metropolitan Avenue, Forest Hills, L. I., N. Y., to handle the sale and representation of aircraft and



Richards

industrial materials. Vosler and his associates, **Ernest R. Cottle** and **A. A. Rice**, were formerly with the **Edo Corp.**

### Daily Plane Utilization Domestic

		March	April
American	3 eng. pass. . .	3:06	5:01
	4 eng. pass. . .	5:44	7:44
	cargo . . .	2:19	4:56
Braniff	2 eng. pass. . .	5:38	5:37
	4 eng. pass. . .	7:16	7:13
Capital	2 eng. pass. . .	7:17	7:36
	4 eng. pass. . .	7:59	8:37
	cargo . . .	4:04	3:22
Carib.	2 eng. pass. . .	4:22	3:41
C & S	2 eng. pass. . .	8:12	8:56
	4 eng. pass. . .	8:46	9:08
Colonial	2 eng. pass. . .	2:52	3:07
	4 eng. pass. . .	5:49	6:08
Continental	2 eng. pass. . .	6:25	6:41
Delta	2 eng. pass. . .	6:57	7:07
	4 eng. pass. . .	6:53	6:49
	cargo . . .	6:27	6:16
EAL	2 eng. pass. . .	10:23	9:59
	4 eng. pass. . .	10:22	9:17
	cargo . . .	7:26	5:56
Hawaiian	2 eng. pass. . .	4:21	5:12
	cargo . . .	2:05	2:03
Inland	2 eng. pass. . .	9:23	9:19
MCA	2 eng. pass. . .	7:03	7:27
NAL	2 eng. pass. . .	6:56	7:03
	4 eng. pass. . .	8:53	8:52
	cargo . . .	2:07	1:56
NEA	2 eng. pass. . .	4:40	5:02
	4 eng. pass. . .	1:29	. . .
NWA	2 eng. pass. . .	7:09	6:55
	4 eng. pass. . .	6:17	7:04
	cargo . . .	4:35	4:34
Trans. Pac.	2 eng. pass. . .	1:09	1:58
TWA	2 eng. pass. . .	5:59	6:19
	4 eng. pass. . .	9:05	8:26
	cargo . . .	6:02	5:45
UAL	2 eng. pass. . .	4:51	5:00
	4 eng. pass. . .	6:40	7:01
	cargo . . .	4:07	3:29
WAL	2 eng. pass. . .	6:26	6:26
	4 eng. pass. . .	4:38	4:44

**AMERICAN HAS RECENTLY COMPLETED ITS**

**20,000<sup>th</sup>  
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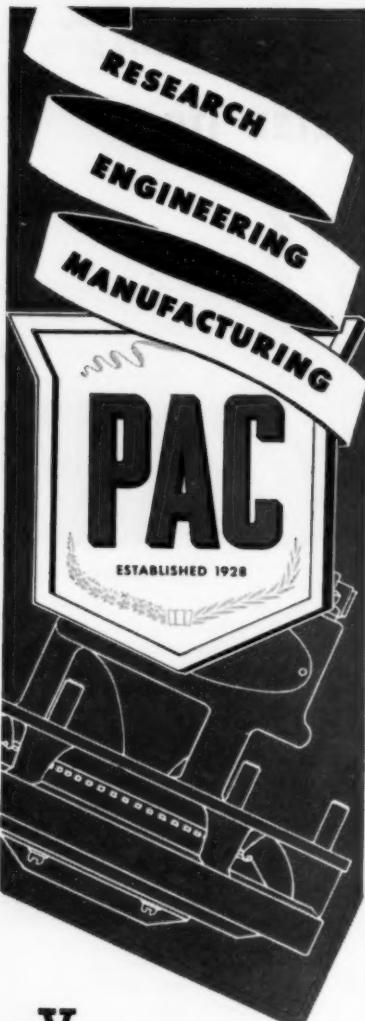
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## OPERATIONS & MAINTENANCE

# Extra Section

By William D. Perreault



THE ACTIVE fleet of more than 150 Convair Liners has now completed more than two years of commercial operation without a single passenger or crew fatality. This period saw the new 40 passenger transport cover some 75,000,000 miles carrying enough passengers to log about 1,480,000,000 passenger miles. In addition to American Airlines, the first line to place Convairs in service, five other domestic and seven foreign airlines are operating the airplane. In establishing this unparalleled safety record the Convair has proved that new airplanes can be safe airplanes.

*It now looks as though all the future transports will be equipped with some type of tire anti-skid device. It seems likely that even the service airplanes will ultimately be provided with this new equipment because of the dollars and cents sense of its adoption. Both AiResearch and Westinghouse are manufacturing promising anti-skid devices. Tests to date indicate that every operator would find it well worth his time to investigate these units.*

During the IATA Jet Symposium an American Overseas Airlines engineering test pilot, Captain Arthur Curran, urged that operational studies of future aircraft should include more realistic accounting for miscellaneous systems which affect over-all performance. He noted that the thermal deicing and air conditioning systems of present airplanes require a fuel supply of about 600 pounds for the trans-Atlantic flight. This was not generally noted in aircraft evaluations but actually amounts to the weight allowance for two passengers. It's the little things that count.

*The case for airborne radar equipment is being strongly reinforced by the advent of high-speed airplanes. Present equipment, weighing about 60 pounds gives an effective range of 30-40 miles. Sir Robert Watson-Watts, father of radar, said recently that it might be expected that suitable equipment for greater range and high accuracy will probably weigh about 100 pounds.*

Airline engineers handling electrical installations should make the "Design Manual on Aircraft Electrical Installations" a standard reference. The compilation of this manual by the Aircraft Industries Association is a major accomplishment filling a long time need for a basis of standardization. The manufacturers will undoubtedly adopt it but it is also necessary that the airlines learn to use and appreciate the standard if it is to prove acceptable later in commercial transport installations.

*Since its installation at Gander in December 1946, Pan American's GCA installation there has aided well over 10,000 flights to land at this key airport when landings would otherwise have been difficult or impossible. Although eight scheduled international airlines and two non-scheduled lines are using the radar aid at Gander on a share-cost basis, Pan American's own operations have represented about one-fourth of all the GCA landings. While many pilots have stated a preference for ILS landings, pilots using the Gander facility are generally enthusiastic GCA fans.*

Ever since the introduction of the step-type door on the Douglas DC-3 there have been incidents in which doors opened during flight. Fortunately, they have all been handled without injury to the occupants. None-the-less, the potential for losses was high. Regulations designed to provide protection during possible crashes have prevented operators from providing double locks. During the ATA conference at Kansas City it was disclosed that one airline has the permission of CAA regional officials to use a chain type secondary lock identical to that used as a safety feature on the doors of homes.

# Simulator for Cruise Control Training Developed by ERCO

Effective cruise control remains a key factor in determining the effectiveness of both military and commercial operations. To the military pilot it may well spell out the maximum field of operations, a determining factor in victory or defeat. To the commercial pilot cruise control can insure economy of operation, greater safety and, in adverse weather conditions, may provide the fuel for the last few minutes over the airport.

Recently Engineering Research Corp., Riverdale, Md., completed the first cruise control and angle of attack trainer ever built. This was a project completed under contract to the Navy's Special Devices Center and is part of ERCO's expanding operations in the field of electronic trainers. ERCO also has a Navy contract for mobile flight simulators with the first production model about ready for delivery now.

The ERCO cruise control trainer provides visual impact to the critical relationship between airplane trim, engine power control and range. In the safety and comfort of the classroom the pilot can work full-scale problems and watch the effect of these cockpit control manipulations on over-size fuel gages, a miles-per-pound gage, etc.

## Jet-Piston Combination

Basically, the trainer consists of three major parts: the instrument panel with associated control circuits and two control pedestals. This unit will serve as a trainer for a reciprocating-engine airplane or for one powered by a turbojet engine. One of the control pedestals, for the jet engine, carries only a single throttle and a knob for use in setting the trim of the airplane. The other pedestal carries the same equipment plus propeller pitch, supercharger, and mixture controls.

The instrument panel has a set of five flight instruments in the center. On the left (see cut) are six instruments related to reciprocating engine operation. When the piston engine control pedestal is in place, the master control switch "on" and engine selector set for this engine, a mobile black board covers the alternate end of the instrument panel as shown here.

By moving the engine selector to the jet engine position the board automatically moves across the panel to cover the reciprocating engine in-

struments and uncover the jet engine instruments.

Another small control board on the face of the instrument panel provides the instructor with a means of "refueling," draining fuel, providing temperature variations and controlling the rate at which the trainer operates.

## Training Speed-Up

This rate control makes it possible to work out range problems on a normal time basis or at an accelerated rate. For the piston-engine airplane the ERCO trainer allows problems to be worked at 10 times normal speed. A one-hour problem can be worked out in six minutes. The jet-engine unit provides speeds up to 20 times the normal rate. This speeds up the training process.

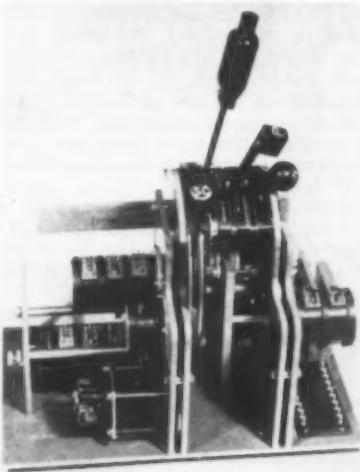
A model airplane directly under the main instrument panel overlays two scales which show the pilot the attitude of the airplane in degrees and the angle of attack. By moving the trim control on the side of the control pedestal the pilot can watch the exact change which takes place in the aircraft attitude, angle of attack, and air miles flown per pound of fuel.

Another small airplane at the top of the panel resets itself each time a new problem is initiated. As the

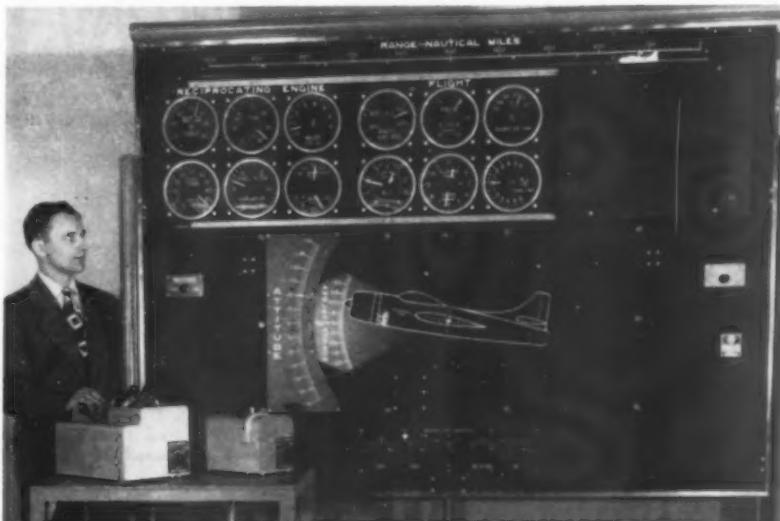
cruise control trainer accumulates flying time during a given problem, the small plane moves across a scale showing the pilot what range he is attaining. In the event that the fuel in the tanks gets below a preset minimum, a red light flashes on telling the student pilot of his shortcoming.

## Non-Standard Instruments

Because a number of the instruments on the trainer are not actually installed in service aircraft, ERCO



THIS VIEW of the piston-engine airplane control pedestal, minus cover, shows the general arrangement including the supercharger, propeller pitch, throttle and mixture controls. On the right side of the pedestal is the control mechanism which is used to govern the aircraft trim condition.



THE COMPLETE simulator including both control pedestals is shown here. Note the simplicity of the jet engine control pedestal. The complete mechanism for the cruise simulator is contained in the framework behind the panel. This unit is 87 inches long by 72 inches high and 28 inches thick. It is mounted on rubber wheels. Only one electrical connection is required to put the unit in operation.

## OPERATIONS & MAINTENANCE

has painted the rims of the non-standard instruments in a distinguishing color to designate its special nature.

### Important to Jets

The Navy is expected to carry on extensive evaluation with this trainer during the next few months. The increasing importance of cruise control as applied to jet aircraft flight will undoubtedly spur industry interest in the versatile cruise simulator. Although not specifically provided in this model, the many factors affecting turbine-powered aircraft range (such as increased fuel consumption at low altitudes) could well be incorporated in such a trainer to simplify the crew familiarization problems related to turbine transport operation.

Meanwhile, ERCO is surveying a number of the airlines to determine what degree of interest will be shown in adopting this type trainer to existing or new airplanes. ERCO has contacted Eastern Air Lines and Trans World Airlines regarding the advantages which might be realized by using the cruise control trainer for the recently ordered Martin 4-0-4's.



**Safer Design**—W. Ziegler (left) and I. J. Hammill of Walter Kidde & Co. are shown discussing proposed improvements in the fire extinguishing system of the B-29 with an Air Force crew chief. Plans call for substituting CB (mono-chloro monobromomethane) as the extinguishing agent in place of the existing agent. Inadequate fire protection on the B-29 has previously been cited as a contributing factor in the extensive B-29 incidents.

## Mountains or Beach



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## TECHNICAL LITERATURE

**GAGING PRACTICES:** The American Standards Association, 70 East 45th St., New York 17, N. Y., has released a 12-page American standard on "Gaging Practices for Ball and Roller Bearings." Price: 50c per copy.

**HOSE GUIDE:** New York Belting and Packing Co., 1 Market St., Passaic, N. J., has released a new guide to the selection, installation and servicing of oil and gasoline hose.

**MOTOR BULLETIN:** Reliance Electric & Engineering Co., 1111 Ivanhoe Rd., Cleveland 10, Ohio, has prepared a two-page bulletin describing three classes of Reliance explosion-proof motors rated from  $\frac{1}{2}$  to 125 horsepower. Copies of bulletin C-130 available upon request.

**CERAMIC CAPACITORS:** Manufacturers' Division, Cornell-Dubilier Electric Corp., South Plainfield, N. J., has available a two-page descriptive piece covering a new line of miniature ceramic disc capacitors, identified as the Tiny Mike. The round disc ceramic is used principally in VHF applications, television and FM for bypass and coupling in assemblies.

**ARC WELDING:** Hobart Trade School, Inc., Box EW-146, Troy, Ohio, is marketing a 544-page book titled "Electric Arc Welding," a practical textbook on the procedure and practice of arc welding. Eight chapters, 600 photographs, diagrams and charts. Price \$3.

**BEARINGS CATALOG:** New Hampshire Ball Bearings, Inc., Peterborough 1, N. H., has published a 12-page catalog describing their line of standard and special ball bearings; fully ground miniature bearings including Conrad radial, full race radial, extra light radial, angular contact, self-aligning and pivot, in a variety of metals.

## NEW PRODUCTS

### **Motor Sweeper**

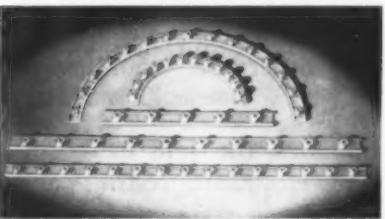
**Wayne Manufacturing Co.**, Pomona, Calif., is marketing a new powered sweeper suitable for use in sweeping runways and paved areas of airports. The unit handles a 10-foot-wide path and



has a capacity of 84 cubic feet which enables it to sweep large areas without stopping. Designed to carry loads up to 20,000 pounds, the Wayne sweeper is powered by a 110-hp Ford industrial engine and has a heavy-duty Ford transmission with four forward speeds and one reverse. Three forward speeds are suitable for sweeping and the fourth governed between 20-25 mph for highway travel. The sweeper is hydraulically operated. In high gear it will load 1.88 cubic yards per minute and in low 1.54 cubic yards. Tires are 10.00 x 15, 14-ply.

### **Channel Nut Strip**

**Elastic Stop Nut Corp. of America**, 2330 Vauxhall Rd., Union, N. J., has introduced a new ESNA gang channel nut strip to provide permanent fasteners for applications subject to repeated



on-off usage. The channel strip is made of 24S-T4 aluminum alloy, blue anodized for easy identification. A new method of cut and raised dimpling retains the nuts securely and prevents over-riding. ESNA claims the nylon locking insert in each nut assures reusability for more than 100 applications.

### **Tube Benders**

**The Imperial Brass Mfg. Co.**, 1200 W. Harrison St., Chicago, Ill., is marketing a new gear-type tube bender designed for use with copper, brass, aluminum or steel tubing, including Bundy and thin-wall conduit. Full 180° bends, the manufacturer says, can be made with the unit. Individual benders are used for  $\frac{1}{2}$ ,  $\frac{3}{8}$ ,  $\frac{5}{16}$ ,  $\frac{3}{4}$ , and  $1\frac{1}{16}$ -inch O.D. tube sizes, nominal tube sizes  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$  and 1 inch. The design makes it possible to slip the bender directly over the

tubing at the point of bend. Can be hand-held or vise-mounted. Extension handles are provided in sizes for  $\frac{1}{4}$  inch O.D. and larger. Described in bulletin No. 382-A.

### **"Hot-Paint"**

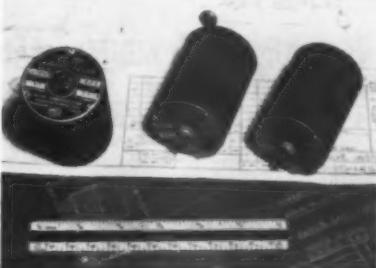
**Electrofilm Corp.**, 7116 Laurel Canyon Blvd., N. Hollywood, Calif., has introduced new "hot paint." This new type heating element is sprayed on the part and protected with insulating varnish. It can be supplied in watt densities up



to 250 watts per square inch and operated at temperatures up to 400° F. The manufacturer notes it is particularly useful to aircraft manufacturers facing extreme low temperature specifications and is currently being adopted for hydraulic cylinders, relief tubes, ammunition boxes, air intake scoops, etc. It weighs about 1/10 pound per square foot. Typical application shown.

### **Isobaric Relief**

**Pacific Airmotive Corp.**, Burbank, Calif., has designed an isobaric relief control valve to operate as a discharge control device for pressurized aircraft small chambers, wave guides, radomes, etc. The unit will limit upstream pressure to any figure up to 45 inches mercury absolute when controlling flows from 5 to 250 cubic inches per minute



discharging to 30 to 3.4 inches mercury absolute. Weight is under .5 pound. Larger sizes are available for other flows and conditions.

### **Groove Gage**

**Nilsson Gage Co., Inc.**, Poughkeepsie, N. Y., has introduced a self-positioning Nilco dial groove gage which accurately measures internal groove diameters and recesses for precision retaining rings of the Truarc type, ordinary snap rings, o-rings, oil and washer grooves. Two extensions on the nose of the gage pro-



vide for maximum versatility of the tool. Dial indicator calibrated in .001, .0005 or .0005-mm calibrations. Each size gage can be set by a simple vernier within a wide range of diameters. Setting can be made with gage block combinations, micrometers, or master ring gages.

### **400-Cycle Motors**

**Lear, Inc., Electro-Mechanical Div.**, 110 Ionia Ave., NW, Grand Rapids 2, Mich., has supplemented its current production of AC, DC and high-frequency motors with certain new frame sizes of precision built 400-cycle motors with ratings up to 2 horsepower. Intermittent and continuous duty versions of the Lear 400-cycle motors are available. These are single-phase, 115-volt and 3-phase, 200-volt Lear 400-cycle motors for aircraft service powering Lear rotary and linear actuators, dry air pumps and similar aircraft controls. Efficiencies up to 73% are available with ratings up to 2 hp at speeds to 10,900 rpm.

### **NARCO Flasher**

**National Aeronautical Corp.**, Wings Field, Ambler, Pa., has designed a new navigation light flashing mechanism for personal and executive aircraft weighing less than 12,500 pounds. The manufacturer claims the unit meets all specification requirements of CAB's draft re-



lease and can be used for 12- or 24-volt electrical systems. The single circuit flasher has been subjected to exhaustive field tests. Hermetically sealed construction to insure corrosion protection and exclude explosive vapors. Requires no servicing or adjustment. Built-in shock mounting protection. Price: \$9.95.

# WHAT'S DOING

## *at Pratt & Whitney Aircraft?*

The most powerful jet engine now streaking through the skies in the United States is the J-48 Pratt & Whitney Turbo-Wasp. Already it is flying in two of the most advanced special-purpose fighter planes for both the Navy and the Air Force.

One is the sleek Grumman Panther (F9F-5) for Navy carrier-based operations. Another is North American's swept-wing F-93A deep penetration fighter for the Air Force. Both of these first-line military aircraft are capable of speeds in the transonic range — 600 miles an hour plus. The J-48 gives to each of these airplanes more power than a four-engined bomber of World War II.

Two of the world's foremost aircraft engine manufacturers — Pratt & Whitney Aircraft and Rolls-Royce, Ltd. — pooled their engineering talents to develop the J-48. And, working independently of its British partner, Pratt & Whitney made a major contribution to improved performance by perfecting an afterburner. It provides greatly increased thrust for take-offs, climb and for short bursts of extra speed in combat.

This hands-across-the-sea teamwork saved time and money, produced a jet engine more powerful than its competitors, and made it available to military services of both countries much sooner than otherwise would have been possible.

Before its successful flights in military fighter planes, the J-48 had completed nearly two thousand hours of ground development testing and several grueling 150-hour endurance tests. During those tests, the engine delivered considerably more power than its guaranteed ratings, both with and without afterburner.

Such extensive flight and ground tests help make it possible to give the J-48 Turbo-Wasp the same built-in dependability and high performance that always has been the hallmark of Pratt & Whitney piston engines — engines that power so many military and commercial airplanes.

The J-48 is the logical successor to the J-42 jet, which has been in production for the Navy more than a year. But the J-48 is not the final answer to aircraft power requirements. Pratt & Whitney Aircraft's engineering and development teams have even further advanced turbojet and turboprop engines running as complete units on experimental test.

## HOW MUCH POWER IS PRODUCED BY THE J-48 TURBO-WASP?

- 8,000 Hp.?
- 9,000 Hp.?
- 10,000 Hp.?
- 11,000 Hp.?



Jet power is measured in terms of pounds of thrust, but, as you know, it can be translated into horsepower. The J-48, which has a basic dry thrust rating of 6,250 pounds, will provide the equivalent of about 11,000 horsepower for a fighter plane at high operating speeds. That's more than four times the power output of the most powerful fighter of World War II. Water injection and an afterburner give the J-48 even greater power increases for short periods.

## WHAT IS THE RATIO OF POWER TO WEIGHT OF THE J-48?

- 1 to 1?
- 2 to 1?
- 4 to 1?
- 5 to 1?



The goal of one horsepower for every pound of engine weight was reached by piston engine manufacturers only after years of effort. But in the field of jet power that ratio has already been far exceeded. The J-48 weighs less than 2,000 pounds and, at the high operating speeds of the fighters in which it is installed, it delivers the equivalent of more than five horsepower per pound of engine weight.

## HOW WAS THE J-48 MADE MORE POWERFUL THAN THE J-42?

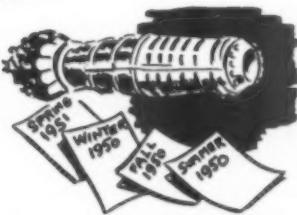
- Increased Airflow?
- Greater Diameter?
- Longer  
Turbine Blades?



One of the toughest problems in designing the J-48 was to increase airflow without increasing engine diameter. By redesigning the impeller to compress more air and by lengthening turbine blades, the engineers increased air consumption by 30 percent and that, in turn, produced more thrust power. It sounds simple, now that it has been accomplished. But it required thousands of hours of designing and testing, first of component parts and finally of completed engines. And yet the over-all diameter of the J-48 is only 50 inches — almost exactly the same as the J-42.

## WHEN WILL THE J-48 BE IN ACTUAL PRODUCTION?

- Summer 1950?
- Fall 1950?
- Winter 1950?
- Spring 1951?



The first experimental model of the J-48 Turbo-Wasp was installed, after extensive testing, in a Grumman F9F in November, 1949. Next came the pre-production engines, several of which are now installed in combat aircraft. Currently, production tooling is well along and the first production engine is scheduled to roll off the line early this fall. Even as this work goes on, Pratt & Whitney engineers are following their historical pattern of simultaneously producing the best engines today and continuing research for even better power plants tomorrow.



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# 30 Airlines Fight for Caribbean Business

**T**HREE'S a lot of talk about over-expansion and uneconomic competition on certain domestic airline routes in this country, but competition on even the most crowded of the domestic routes is relatively light when compared to the situation in the Caribbean area.

There, in an area which was virtually the sole domain of Pan American World Airways two decades ago, 30 scheduled international airlines are engaged in one of the greatest traffic fights in airline history.

And, to a considerable extent, it's a struggle for "business that just isn't there."

The total population of the Caribbean islands and the countries bordering the Caribbean, including Mexico and the north coast of South America, is only 65,235,000, as against the more than 150 million population of the United States. Furthermore, the U. S. has a per capita income at least 25 times greater than in Latin America, where the great mass of the population is made up of peasants and low-income workers who could not afford an airplane ride at any price.

Yet the number of scheduled airlines serving this area of low traffic potentials is just about double the number of trunk airlines blanketing the United States.

## PAA Dominated

In the mid-1930's Pan American operated more than half of all the air routes in Latin America and was the dominant factor in the hemisphere's transportation picture. As late as 10 years ago, it was the only airline linking all the Caribbean area republics and was operating 9,767 route miles through and around the area, which was 76% of the total international airline mileage then operated there.

PAA's only competitors in 1940 were KLM Royal Dutch Airlines, with a route branching out from Curacao and Aruba to Port of Spain, Trinidad, and Barranquilla, Colombia; TACA, with 1,700 miles of Central American routes; British West Indian Airways, with a short route from Port of Spain to Barbados; and Caribbean-Atlantic, with a 160-mile route from San Juan to the Virgin Islands.

In the decade since then, the population in that area has increased, and so has air traffic, but there has been no great upsurge of business sufficient to explain the tremendous expansion

of air service there. The number of international airlines in the Caribbean area has increased from four to 30, and the route-miles operated have jumped from 12,862 to over 54,000, of which PAA's share has dropped to about 20%.

Nor do these route mileages include operations of the many charter air carriers that further complicate the competitive picture. Just a year or two ago, 40 non-skeds were operating out of Puerto Rico alone. The number has now thinned out somewhat, but non-skeds still flew more than 45,000 passengers between San Juan and the U. S. last year, according to the Puerto Rican Transport Authority.

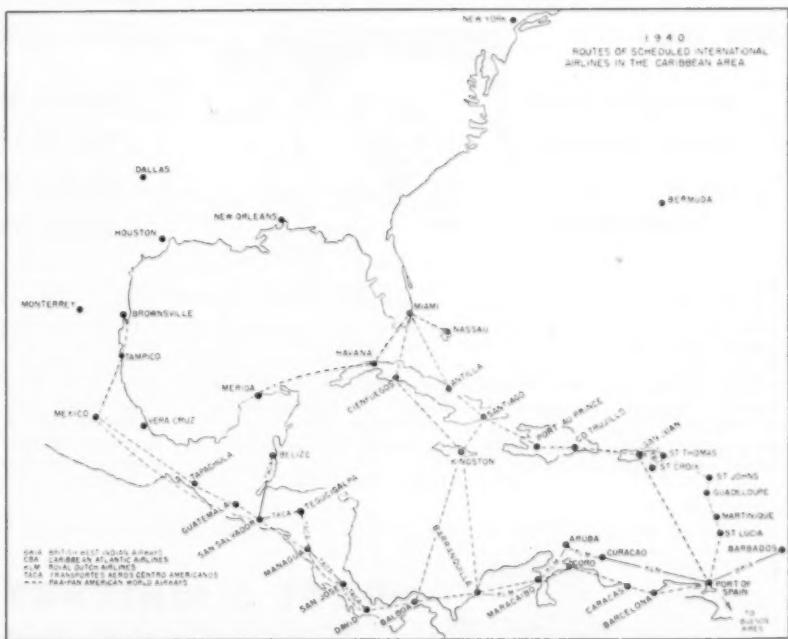
## Many Flags

Flags of many countries are seen on the planes operating in the Caribbean area today. Six U. S. carriers are there, including PAA, which pioneered the territory aviationwise, and Eastern, Braniff, American, National and Chicago and Southern, all of whose domestic routes have branched out into the international field in recent years. All the others are flag lines of Latin American and European countries.

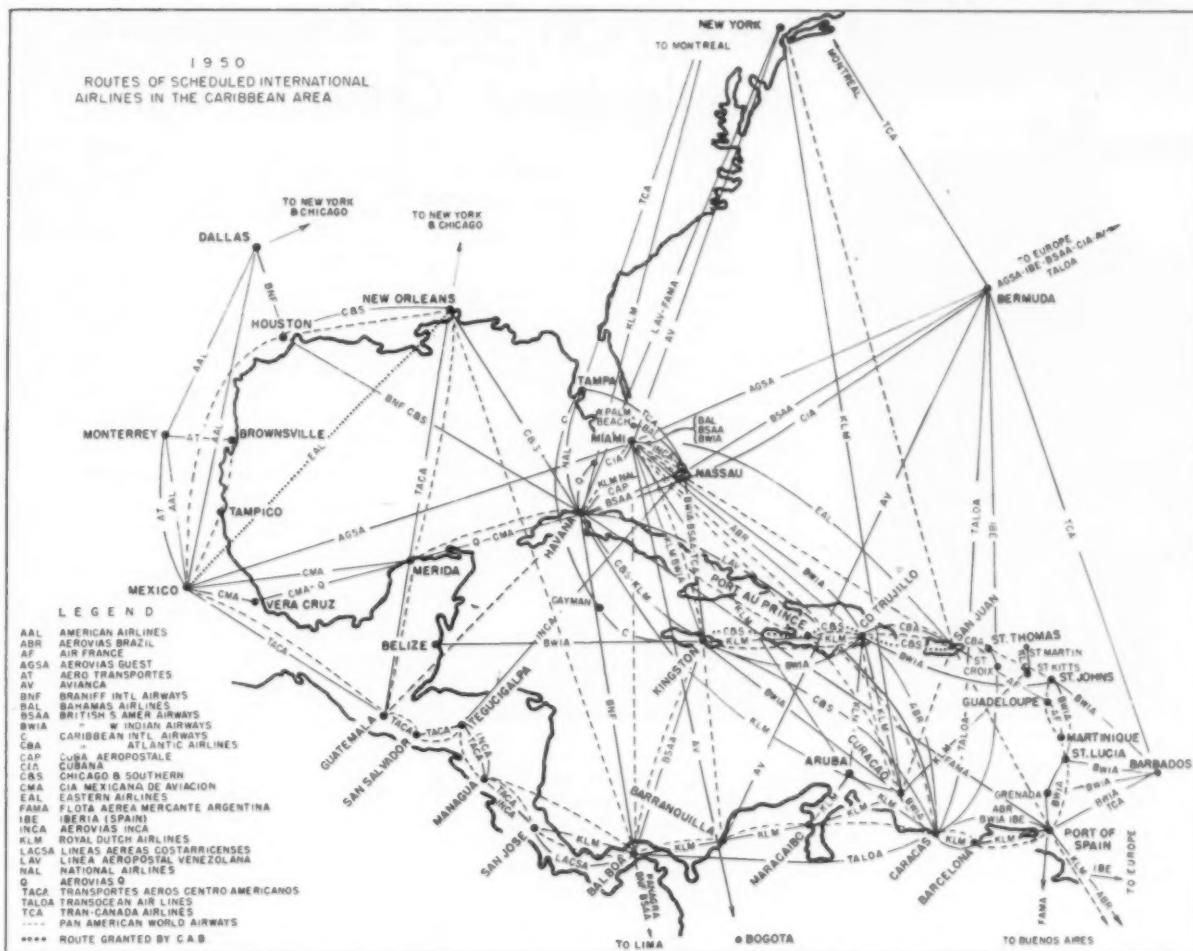
The European carriers are among the largest operators in the area, criss-crossing the Caribbean from Miami to Port of Spain, from San Jose to San Juan, and serving many ports besides their own governments' colonial outposts there.

KLM flies some 4,640 route miles in the Caribbean, serving its Netherlands West Indies possessions and Netherlands Guiana; Air France has a toe-hold in the French West Indies and is authorized to fly between French Guiana and Miami as soon as equipment becomes available; and British South American Airways and British West Indian Airways fly 3,700 route miles in the Caribbean, including the mainline run from Port of Spain to Miami.

Latin American lines, meanwhile, have stretched out as far as Europe. Avianca of Colombia now flies from Bogota through Miami to New York and from Bogota through Bermuda to Rome. Compania Cubana de Aviacion not only competes on the rich Havana-Miami route but also flies from Havana to Madrid. Compania Mexicana de Aviacion flies from Havana to Mexico City. And Aerovias Venezuela Europa has a weekly



1940—Here's what the airline route pattern in the Caribbean area looked like in 1940, when four carriers operated 12,862 route miles there and Pan American World Airways had 76% of the total mileage.



**1950** This maze of lines is the scheduled air transport route pattern in the Caribbean area as it looks in 1950, with 31 international airlines flying some 54,000 route miles. Map does

flight from Caracas to Lisbon and Rome and another from Caracas to Lisbon, Madrid and Paris.

Recently, Trans-Canada Airlines invaded the area with routes from Montreal through Bermuda to Port of Spain and from Montreal and Toronto to Tampa and thence to Nassau and Jamaica. Another newcomer is Linee Aeree Transcontinentale Italiane, which flies from Caracas to the Azores, Seville, Spain, and Rome.

And the end is not in sight. Other carriers have been granted or have applied for other routes in the area and between the U. S. and the Caribbean.

It can't very well be said, however, that traffic density is much of a factor in this mushrooming of air service in Latin America. There is more air travel between New York and Miami than on any Latin run, yet this is shared between only two scheduled domestic airlines—Eastern

not show the routes of two recent additions—Aerovia Venezuela Europa and Linee Aeree Transcontinentale Italiane.

and National—whereas as many as six scheduled carriers are competing for business on some of the routes in the Caribbean area.

### Cost Handicap

Besides the excessive competition, there are other elements that handicap U. S. carriers operating in the area. Higher salaries, wages and expenses, plus more exacting requirements, bring their costs far above those of most foreign carriers. Also, devaluated foreign currencies provide a virtual discount for foreign nationals traveling over their own flag lines.

Artificial restrictions on traffic enter the picture, too. Under the "sterling bloc" policy, only a British line can fly passengers between the British West Indies or between them and the mother country. Pan American flies between Jamaica and Trinidad but can't haul any payload from

one to the other; in fact, it can't even fly a passenger from Port of Spain to London.

Avianca today carries the major part of the New York-Bogota traffic, since it can offer the fastest service, with stops only at Miami and Barranquilla and no plane changes. The only alternate service involves flying three airlines—domestic from New York to Miami, Pan American to Barranquilla and Avianca to Bogota.

What probably may be regarded as a prime example of uneconomical competition involves the French island possessions of Martinique and Guadeloupe. Prospects are that three major airlines, possibly four, soon will be serving these two small islands with a potential passenger list smaller than a small town in the rural U. S., for until sanitation, hotel and tourists facilities are improved, the vacation travel there will be negligible.



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## TRAFFIC & SALES

# New Non-Sked Regulations Would Limit 'Cream' Flights

By WILLIAM V. HENZEY

THE Civil Aeronautics Board next month will adopt regulations which may form the last chapter in the hectic postwar saga of the wildcat airlines. Accused in some circles of over-cautiousness and even timidity in dealing with the non-scheduled industry in the past, CAB pulled no punches last month when it made known its plans.

First, the Board denounced those non-skeds which openly violated the Civil Aeronautics Act by operating flights at such frequency as to assume the characteristics of certificated airlines. Such other practices as pooling operations through ticket agencies to circumvent the regulations, misleading advertising, and the like, also were sharply criticized.

But it wasn't all talk. Applications of eleven large irregulars for specific licenses to operate were denied and unless they take advantage of a 30-day grace period in which to protest the action, their right to operate under last year's blanket authority will cease automatically.

Applications of three others were approved but added restrictions limit the number of flights that may be operated between designated heavy traffic points to three every four weeks. Likewise, between less productive cities, no more than eight flights may be operated in a four-week period.

### 82 Applications Pending

When considering the carriers whose applications were approved and those most likely to receive approval in the future, under CAB's outlined standards, such restrictions will not be burdensome.

However, there were 96 non-skeds which applied for specific licenses and 82 of these still remain to be acted on. Included in this group are the carriers which have consistently been cited for violations, who can be expected to protest denials of their individual applications, and who may go on their merry way until all the remedies available to them through quasi-judicial and judicial processes are exhausted.

At these, CAB's latest action is aimed. Since the carriers which had been granted specific exemptions to operate were limited to a maximum number of flights, and since these were the carriers which had not violated the law, thus assuming the

role of "approved" non-skeds, CAB ruled that similar restrictions should be imposed on those whose applications were still pending to avoid discrimination against the "approved" carriers.

It would take considerable time to act on the remaining 82 applications, the Board reasoned, and there is no reason to permit chronic violators to operate "cream" services in the interim while restricting the "approved" lines to "skimmed" operations.

### Uniform Limitations

Thus, the Board on June 5 issued a draft release of a new regulation which would bring the entire large irregular carrier industry under uniform operating limitations. All interested parties were given until July 10 to submit comments which will be weighed by the Board together with all other available information. Subsequently, the restrictive regulation will be issued, most likely before July expires.

As previously stated, it will limit flights by a non-sked to three every four weeks between heavy traffic points. The following pairs of cities come within this category:

(a) between New York and Miami, Puerto Rico, Los Angeles, San Francisco, Chicago, and Detroit;

(b) between Miami and Puerto Rico;

(c) between Los Angeles and San Francisco, and

(d) between Chicago and Los Angeles, San Francisco, Seattle, Washington, and Miami.

In other areas which have proved substantially less than fruitful in the past for the non-sked, a total of eight flights would be permitted every four weeks. In all, assuming the existing carriers intend to continue operating under the new restrictions, their take of the nation's annual travel market will drop from an estimated \$15 million to approximately \$3 million.

But there are those which may not elect to continue under such limitations and CAB action on their individual exemption applications may be anticlimactic as it was in the cases of ten of the eleven which were recently denied, who long ago had ceased operations.

### Protests Planned

Recognizing this as the only possible alternative if the new rule is adopted was a group headed by the

## TRAFFIC & SALES

presidents of two non-skeds which are currently in the midst of enforcement proceedings for alleged willful and knowing violations of the Act. They told the press in New York that the new regulations would cut their business 80%, throw a million persons out of work and drive the lines out of the passenger business. They were reportedly engaged in raising \$100,000 for a last-ditch fight against CAB's proposal.

Another group flooded Congress with telegrams urging support against the CAB "purge." Still another group was planning a "Washington Air Lift" around July 1 to "alert the American public to the government agency's attempt to bar free enterprise from the skies and throw many thousands of ex-GI's out of work." They intend to picket the Capitol, the White House, and CAB. In all, their response was reminiscent of that of a year ago when the Board promulgated what is now known as Economic Regulation 29.

In fact, each step which CAB has taken in the past to curb the non-scheduled industry has been propagandized as an attempt to eliminate the large irregular carriers from the air transport scheme. Whether true or not, there has been little success, either because the non-skeds were effective in their protests, because the means adopted by the Board were insufficient, or because there was no intention of eliminating them outright.

In a recent statement of policy, CAB said there is a place for the fixed-base operator type of non-scheduled airline at least for a limited period of time. There was no doubt left, however, that the transport-type large irregulars were not included in this category and the inevitability of their extinction in the near future is a comparatively sound conclusion to be drawn. To this end, the new restrictive regulation is aimed.

### CAB CALENDAR

July 10—(Docket 4193) Hearing on application of United Air Lines for permanent authority to operate over certain all-cargo routes. Tentative. Examiner Joseph L. Fitzmaurice.

July 10—(Docket 2724) Further hearing in Colonial Airlines, Inc. Final Mail Rate Case. Tentative. Examiner R. Vernon Radcliffe.

July 10—(Docket 4435) Hearing in CAB investigation of Braniff Airways Local Excursion Fares. Tentative. Examiner Paul N. Pfleiffer.

July 24—(Docket 3718 et al.) Hearing re-convened in Southwest Airways Certificate Renewal—United Air Lines Suspension Case. Tentative. Examiner Paul N. Pfleiffer.

July 26—(Docket 3966 et al.) Hearing re-convened in West Coast Airlines Certificate Renewal—United Air Lines Service Suspension Case. 10 a. m., South Lounge, Carlton Hotel, Washington. Examiner J. Earl Cox.

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*The Tutwiler*  
Ira Patton, Manager

in NEW ORLEANS

*The St. Charles*  
J. J. (Mike) O'Leary,  
Vice Pres. & Mgr.

in NASHVILLE

*The Andrew Jackson*  
Leon Womble, Manager

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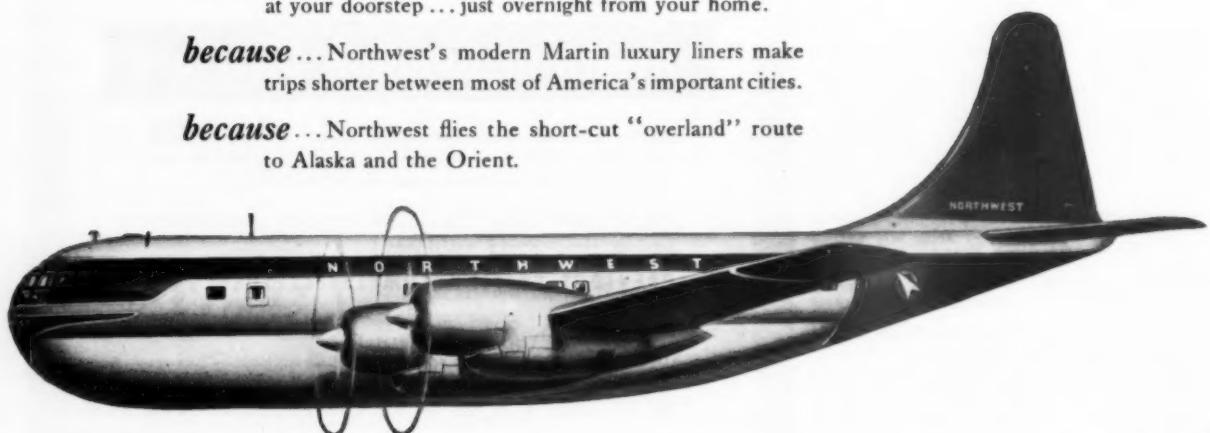
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***because*** . . . Northwest's modern Martin luxury liners make  
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***because*** . . . Northwest flies the short-cut "overland" route  
to Alaska and the Orient.



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SPOKANE, PORTLAND, HONOLULU . . . CANADA . . . ALASKA . . . JAPAN . . . KOREA . . . CHINA . . . FORMOSA . . . OKINAWA . . . THE PHILIPPINES

## CAB Briefs

CAB issued a consent order directing **American Airlines** to cease and desist from certain cargo practices and alleged unfair methods of competition which were responsible for the institution of a Board investigation last winter. Generally, American must refrain from (a) misapplication of volume cargo rates, (b) unjustly discriminating against Airborne Flower and Freight Traffic, Inc., or any other shipper in the allocation of space, and (c) participation in the operation of Bay Area Shippers and Growers, Inc.

The Board last month closed the books on its investigations of finances, routes and operations of **Capital Airlines** and **Colonial Airlines**, started in 1947. It said additional field surveys are not warranted and data obtained in the field surveys of three years ago would contribute little to the solution of current problems.

**Pacific Northern Airlines** and **Alaska Airlines** have been granted temporary exemptions (good until September 15, 1950) permitting special operations between Seattle and Alaska for the summer season to transport workers of the fishing industry. PNA is authorized to operate an unlimited number of flights, and Alaska to perform 25 round-trips.

The Board authorized **Pan American World Airways** to suspend its Boston-Bermuda service except during the months of March and April each year on grounds of insufficient traffic.

The Board recently reversed an earlier decision and awarded **Northwest Airlines** an exemption to serve Taipeh, headquarters of the Chinese Nationalist government on Formosa, as an intermediate point between Tokyo and Manila, replacing Communist-held Shanghai. Service of one round-trip flight a week has been instituted.

**Delta Air Lines** has applied for a 655-mile extension of its routes from Columbia, S. C., to Washington and New York, via Fayetteville and Wilson, N. C., and Philadelphia.

CAB's decision in the Milwaukee-Chicago-New York Restriction Case made permanent the Pittsburgh-New York segment of **Capital Airlines'** Route 14, heretofore operated under an exemption order. A condition attached to the amended certificate will require two intermediate stops on flights between Chicago and New York, and will prevent non-stop operations between New York and Detroit, Toledo, Milwaukee or Twin Cities. Major benefit to Capital is an authorization to conduct direct services between Cleveland and New York either on a non-stop or point-to-point basis.

Recognizing the sharp drop in **Continental Air Lines'** passenger load factors last year coincident with the introduction of Convair-Liner aircraft on its route, the Board has proposed that the carrier receive \$412,000 additional mail pay for 1948-1949. For the period on and after January 1, 1950, CAB proposes a sliding scale rate for the carrier which will average 29 per revenue plane mile.

## Over the Counter

### Sales Promotion

Airlines and other carriers will be interested to note a story in *ASTA Travel News*, published by the **American Society of Travel Agents**, which states that 86% of a special panel of travel agents assert that they receive too much literature. They don't say who is guilty, but if the shoe fits, put it on. Agents estimated that they get 50 to 100 separate pieces of literature daily, and that a substantial portion of waste is involved in the material sent to them. They'd like to receive one or two copies of new literature, instead of bulk shipments, with a return postcard which they can use to get more if they want it. Said one agent: "Waste can be trimmed down and our time can be conserved by the elimination of 'pep' letters —'padding-us-on-the-back' letters . . . We know full well that we must sell or starve. Why these countless and needless letters urging us to do our best?" Another said: "We want material giving rates, pertinent details and commission payments. We want information that will induce us to sell a given offering and that will help us close sales."

**Panagra** has just published a timetable in Chinese, aiming at the traffic between South America and the Orient. It gives flight times and fares between South America and cities in the U. S. and Far East served by **Panagra-PAA**. If we recall correctly, **Braniff** was the first airline to print a Chinese timetable—and it was successful, too.

Congratulations to **Western Air Lines** on an attention-getter. It's a direct mail piece in Christmas card form (Santa Claus on the front) and creates a lot of interest when received in summertime. Theme is that Western "has the Christmas spirit every day," giving you "luxury Convairliners" and "thrifty air coach service" . . . **Canadian Pacific Airlines** has issued a folder playing up its food service on Pacific flights . . . **Pan American-Panagra** have out a new folder, "See South America This Summer," describing tours that are available.

### Traffic and New Services

**Pan American World Airways** will start its first Stratocruiser service to South America on July 5. The flight, El Presidente, will be New York-Buenos Aires extra-fare sleeper service, operating twice weekly. Flying time will be cut 11 and a half hours to 26 hours 10 minutes southbound and 25 hours 14 minutes northbound. Stops will be made at Port of Spain, Rio de Janeiro and Montevideo. Extra fare will be \$10 to Rio, \$20 to Buenos Aires. In addition, an upper berth will cost \$10 and a lower \$20 . . . In the Pacific, PAA last month started Stratocruiser service from Honolulu to Tokyo and Manila, providing all sleeper accommodations with the passenger given his choice of a sleeperette seat or berth in conjunction with conventional seats at no extra charge. Berth charge on U. S.-Honolulu remains at \$25 . . . PAA has also increased **New York-London Stratocruiser** service from one to two round-trips daily, one operating non-stop, the other via Shannon.

Two major airlines, **TWA** and **Northwest**, are giving up their downtown ticket offices in Washington, D. C., and are entering a consolidated office with **Colonial** and **Braniff** in the Continental Building, next to the Statler Hotel. TWA, NWA and Colonial will have personnel in the office, ticketing their own passengers. Between them they will handle Braniff business and will also ticket each others' passengers if the need arises. TWA and NWA estimate that yearly savings from the consolidation, effective Sept. 1, will be substantial. Colonial and Braniff have not had downtown offices.

**TWA** plans to inaugurate a DC-4 transcontinental all-cargo flight this fall. The company has been using C-47's . . . **Continental Air Lines** transfers operations at Lawton-Fort Sill, Okla., from Post Field to Lawton Municipal Airport on or about July 1 . . . **Western Air Lines** has proposed a \$9.95 round-trip excursion fare Los Angeles-Palm Springs, to help promote Palm Springs as a summer resort. The fare would be made effective as soon as CAB permits and would be available until Oct. 31.

**Philippine Air Lines** has asked CAB to approve a sharp cut in trans-Pacific berth surcharges, reducing Manila-San Francisco from \$50 to \$20 and Manila-Honolulu from \$25 to \$10 . . . **Frontier Airlines** has been authorized to suspend service temporarily at Casper and Rawlins, Wyo., on segment 2 and at Riverton-Lander and Casper on segment 3 of Route 74 . . . **KLM Royal Dutch Airlines** has added a second weekly DC-4 all-cargo flight between New York and Europe . . . **Colonial Airlines** is offering all-expense tours to Canada with four, five and seven-day cruises available from \$51 to \$144 . . . **Eastern Air Lines** will transfer operations at Augusta, Ga., from Daniel Field to Bush Field about July 2.

**Northwest Airlines** hopes to start Stratocruiser service to the Orient by early autumn, two flights weekly . . . **Frontier Airlines** plans to start Phoenix-El Paso service about July 15 with intermediate stops at Safford, Ariz., and Lordsburg, Deming and Las Cruces, N. M. . . . **British West Indian Airways** starts low-fare tourist service between Miami and points in Jamaica on July 15, using 24-passenger twin-engined Vikings. One-way Miami-Kingston fare will be \$53, Miami-Montego Bay \$46. These are \$9 under standard fares.

—ERIC BRAMLEY

# Airline Commentary

By Eric Bramley



## AIRLINE PEOPLE

### ADMINISTRATIVE

**Leonard S. Holstad**, treasurer of Northwest Airlines, is the new chairman of the financial committee of the International Air Transport Association. He had served previously as vice chairman.

**C. A. Clarke** has been promoted from manager of properties for American Airlines to assistant to **O. M. Mosier**, vice president. Clarke has served with AA in various supervisory capacities for 18 years. In his new post he succeeds **R. W. Tuttle**, who is on leave of absence to work on the development of Manhattan Air Terminals.

**Herman R. Semmelink** has been appointed Canadian representative for KLM Royal Dutch Airlines, succeeding **William deMier**, who has been transferred to KLM's offices in Europe.

### OPERATIONS-MAINTENANCE

**Capt. Joseph J. Kelley** has been appointed eastern division operations manager for Eastern Air Lines, after serving 15 years as co-pilot, flight captain and check pilot. He succeeds **Capt. E. H. (Pete) Parker**, who retired from EAL to join his son in the management of an automobile sales and service agency they formed in New Jersey several years ago.

**M. B. Joyner** has been appointed superintendent of station service—overseas for Trans World Airlines, with headquarters at Orly Field, Paris. A 21-year veteran with TWA and its predecessor company, Trancontinental Air Transport, Joyner was assistant manager of ground service, based at Kansas City, prior to receiving his overseas appointment.

**Robert C. Smith** has been named station manager for Pacific Northern Airlines at Homer, Alaska, replacing **Arthur T. Hewlett**, resigned.

**Capt. D. R. Petty**, formerly in charge of United Air Lines flight personnel flying east from Denver, has been named flight manager at Los Angeles, succeeding **Capt. T. W. Jobson**, who requested a return to active flight duty. **Capt. Frank Crismon**, formerly in charge of crews flying west from Denver, has assumed responsibility for all Denver-based pilots.

### TRAFFIC & SALES

**Jack Lewis**, formerly vice president-operations for Monarch Air Lines, has joined Continental Air Lines as supervisor of schedules and tariffs, replacing **Richard L. McGrew**, resigned. Lewis has been associated with aviation for 25 years.

**Norman L. Hess**, western regional director of sales for American Airlines, is supervising cargo sales following the

**WE WERE** on hand June 17 when Capt. **Eddie Rickenbacker**, president of Eastern Air Lines, arrived in Washington aboard a special plane with all his company officials, and we had a nice chat with him. The group is visiting every station on the EAL system, and the Captain says it's the first time in any industry that all the top brass has gone out en masse on such an expedition. Personnel at each station gather to hear company plans, and to present any gripes or suggestions they may have (and there have been plenty of both, he says). When the tour is over, the headquarters group will have met over 99% of EAL personnel. We asked the Captain what the smallest station was that had been visited. Rome, way down there in Georgia, he said, where the plane load of brass—Rickenbacker, **Paul Brattain**, **Warren Moore**, etc.—descended upon one lone man (the other employee was sick) and had a full-dress session with him. One thing that the EAL people like is that since the group has been on tour they haven't been bothered with a stream of memos from headquarters and have been able to get some work done, says the Captain, adding that maybe he ought to keep them on the road all the time. He also informs us that he now has his own "flying saucer." It's rotund (300 lbs., says Rick) **Bev Griffith**, EAL's public relations chief. He's round and he flies, says the Captain.

Another well-known airplane is leaving domestic airline service. TWA has placed its first Boeing Stratoliner in mothballs and the others are to follow during the summer. This particular airplane had 24,994:49 hours of service on TWA and just missed rounding out 10 full years of active service by 17 days. A good Boeing product that served well.

Who operates the most northern air service in the world? *American Aviation Daily* recently made the flat statement that the Scandinavian had the most northerly scheduled flights in the north of Norway, but this brought a quick rejoinder from George Rayburn, executive vice president of Wien Alaska Airlines, and the *Daily* staff had to get busy calling government sources to find out who was right.

It turns out that Rayburn was right—by 13 miles. Back in 1928 Noel Wien flew a Stinson Detroiter with a J4B engine to Point Barrow, northernmost point of Alaska. In 1944 Wien Alaska filed for a regular passenger-freight-mail route, but the CAB didn't get around to giving its okay until 1949. Meanwhile, the airline operated schedules anyway to Point Barrow and Barrow, six miles apart. Now it flies twice-weekly and carries as much as 4,500 lbs. of mail per flight with DC-3's, C-46's and other equipment.

In case you're interested, Point Barrow is 71 degrees 23 minutes latitude while the North Cape of Norway is 71 degrees 10 minutes latitude. The northernmost town of Norway served by Scandinavian Airlines System is Hammerfest, which is 70 degrees 40 minutes and six seconds. So Wien Alaska wins by an iceberg. (One minute in latitude is one nautical mile.) Incidentally, these Arctic points are about 1,150 nautical miles south of the North Pole, and some 4,250 nautical miles north of the equator. If they aren't, blame it on the amateur navigators on the *Daily* staff.

Keith Kahle, president of Central Airlines, will sell aviation at the drop of a hat. Not so long ago he was on a train (yes, a train) traveling to Ft. Worth from a non-airline point which Central hopes to serve. The train was delayed for several hours behind a stalled freight train. As missed engagements and upset appointments fanned a growing ill humor into open grumbling among the passengers, Keith heard opportunity's knock. Opening his briefcase and removing his supply of Central timetables, he canvassed the train from end to end, passing out the timetables and subtly suggesting to his fellow passengers that stalled freights don't detain feederlines. Suddenly he was pounced upon by the already-harassed conductor and another rail official who happened to be aboard, and was ordered to cease and desist. He agreed readily—his timetable supply had been exhausted.

resignation of R. K. Warner, regional cargo sales manager.

**William L. Morrisette, Jr.**, has rejoined Eastern Air Lines after a short absence during which he was in business for himself and has been named traffic and sales manager for the New England states.



Morissette

for Western Air Lines in Los Angeles, has joined Pan American World Airways in London as sales manager for Great Britain. **Keith Jones** has been moved up to fill the post in Los Angeles.

**Elizabeth Cherry Shafer** has been appointed administrator—women's sales development for Trans World Airlines. She formerly was coordinator of displaced persons and immigration traffic for Scandinavian Airlines System in Berlin.

**Thomas Berton Moore** has been named assistant district publicity manager for United Air Lines in Los Angeles.

**James W. Alexander, Jr.**, has been named assistant to the director of public relations for Chicago and Southern Air Lines, with offices in Chicago.

**George Curtis**, reservation manager for American Airlines in Boston for the past four years, has been appointed manager of reservations procedures, replacing **W. R. Winn, Jr.**, who has resigned.

**James J. Abbott**, formerly regional supervisor of catering for the southern and western regions of American Airlines, has been appointed supervisor of catering for the AA system, replacing **Howard Baumgardner**, who resigned after more than 20 years of service to buy a farm in Ohio.

**Lowell A. (Larry) Gardner** has been named manager of training and information in the reservations and ticket office division of American Airlines. He formerly was regional supervisor of training in Chicago.

**Philip M. Siefert**, district traffic manager for Pan American World Airways at Port of Spain, Trinidad, for the past two years, has been named to fill the new position of agency and interline sales representative at the Latin American Division's headquarters in Miami. **Frank B. Ramey**, former district traffic manager at St. Thomas, Virgin Islands, has been assigned to Siefert's former post, and **Hollis Sweat**, former special traffic representative at Montego Bay, Jamaica, takes Ramey's place at St. Thomas.

**William F. Prigge** has been named manager of reservations and ticket offices for American Airlines' eastern region. **Henry O'Neill** replaces Prigge as manager of space advertising.



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A.B.C. REPORTS — FACTS AS THE BASIC MEASURE OF ADVERTISING VALUE

# U. S. Domestic Airline Revenues & Expenses, Jan.-March, 1950

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME
American	\$ 19,453,198	\$ 16,092,244	\$ 1,289,069	\$ 431,986	\$ 1,369,337	\$ 219,680	\$ 3,740	\$ 21,234,411	\$ 10,042,381	\$ 11,192,030	\$ -1,781,213
Braniff	3,387,123	2,584,181	578,368	70,209	78,989	25,959	48,041	3,446,953	1,620,110	1,826,843	-59,829
Capital	5,919,605	3,687,801	1,455,886	172,538	348,279	29,542	162,238	6,047,637	2,714,438	3,333,200	-128,932
Caribbean	21,4976	150,569	47,488	.. .	8,059	1,019	3,135	209,061	90,600	118,462	5,914
C & S	1,894,980	1,329,720	456,027	41,437	40,884	17,346	.. .	1,945,470	793,563	1,151,907	-50,490
Colonial	770,478	520,490	225,582	6,562	9,064	4,524	557	1,035,223	455,668	579,555	-264,765
Continental	1,166,641	764,769	335,321	8,172	21,596	6,835	15,534	1,379,856	626,907	752,948	-223,215
Delta	4,744,411	3,988,947	474,432	63,168	111,759	67,719	6,798	4,209,970	2,071,392	2,138,376	534,661
Eastern	20,776,792	18,583,318	829,273	339,196	619,127	356,362	9,594	17,280,871	9,225,425	8,055,446	3,495,922
Hawaiian	746,635	639,068	7,446	28,628	52,403	15,565	2,862	822,122	327,405	494,717	-73,468
Inland*	620,589	429,656	176,009	3,614	6,403	4,108	113	556,990	227,860	389,130	63,599
MCA	1,743,811	1,253,713	423,793	17,315	23,381	11,574	6,816	1,680,366	671,326	1,009,062	63,245
National	4,790,598	4,082,949	437,483	104,711	66,017	71,208	10,140	3,716,632	1,954,975	1,761,657	1,073,965
Northeast	1,112,148	670,201	321,665	15,560	17,608	2,846	2,852	1,373,432	674,396	699,036	-261,284
Northwest	5,573,336	4,411,440	712,007	133,013	243,329	33,190	13,355	9,288,846	4,891,837	4,397,009	-3,735,510
Trans Pacific	122,853	94,687	.. .	358	1,293	1,155	22,924	117,984	67,710	110,274	-55,131
TWA	13,018,924	10,478,008	1,345,724	391,634	551,192	127,447	62,350	14,531,930	7,166,615	7,365,315	-1,513,006
United	17,508,328	13,849,484	1,633,270	626,478	1,071,261	138,172	65,934	19,761,629	8,793,620	10,968,009	-2,253,301
Western*	2,295,896	1,420,111	447,187	33,761	32,887	12,119	33,201	2,343,254	1,137,667	1,205,587	-47,359
TOTALS	105,863,342	85,031,386	11,192,030	2,488,300	4,672,866	1,146,372	772,144	111,042,857	53,554,293	57,488,565	-51,179,517
* Operations of Western and its subsidiary, Inland, should be considered as consolidated, although reports are filed separately as shown here.											
NOTE: Under CAB filing procedures, the airlines file a cumulative quarterly financial report for January-March in place of a separate report for the month of March. Traffic data, however, are reported separately for each month.											

# U. S. Feeder Airline Revenues and Expenses, Jan.-March, 1950

AIRLINES	TOTAL OPERATING REVENUES	PASSENGER REVENUES	MAIL REVENUES	EXPRESS REVENUES	FREIGHT REVENUES	EXCESS BAGGAGE REVENUES	NON-SCHEDULED TRANSPORT REV.	TOTAL OPERATING EXPENSES	AIRCRAFT OPERATING EXPENSES	GROUND & INDIRECT EXPENSES	NET OPERATING INCOME
All American	\$ 486,321	\$ 153,143	\$ 322,894	\$ 7,785	\$ .. .	\$ 443	\$ .. .	\$ 735,410	\$ 366,736	\$ 378,675	\$ -249,089
Bonanza	193,323	62,273	129,282	139	1,187	440	.. .	197,368	84,203	113,165	-46,046
Central	163,741	9,078	153,827	.. .	.. .	59	444	151,751	64,197	87,554	11,990
Challenger	256,256	66,584	186,082	1,285	2,874	489	752	298,979	145,164	155,815	-40,723
Empire	222,054	69,535	149,674	1,453	.. .	491	661	225,589	111,757	113,832	-3,535
Mid-West	146,568	9,220	135,281	.. .	.. .	57	.. .	136,262	76,340	61,922	8,306
Monarch	368,558	80,469	275,501	1,451	5,820	274	3,896	405,848	221,232	184,612	-37,286
Piedmont	596,609	249,799	332,294	4,335	5,120	2,153	1,212	650,490	370,459	260,031	-53,881
Pioneer	806,394	368,373	404,339	3,825	8,209	2,784	7,177	740,191	367,048	373,142	66,203
Robinson	193,537	103,187	85,671	1,987	2,412	404	.. .	279,756	154,836	124,917	-86,217
Southern	414,227	52,995	357,386	2,169	3,460	340	.. .	379,602	197,891	181,712	34,625
Southwest	454,629	188,606	247,582	3,646	9,886	1,391	956	486,333	220,919	265,414	-31,704
Trans-Texas	547,031	116,058	422,873	2,511	3,605	844	993	553,725	282,063	271,662	-6,695
Turner	115,146	11,657	71,500	686	.. .	109	31,088	127,230	64,306	62,924	-12,086
West Coast	261,743	83,018	175,319	1,032	.. .	218	278	294,368	138,625	155,743	-32,625
Wiggins	39,651	2,194	37,454	.. .	.. .	3	.. .	49,741	26,576	25,166	-10,090
Wis. Central	349,511	71,590	273,853	3,287	.. .	358	.. .	407,305	208,269	199,036	-57,794
TOTALS	5,615,299	1,697,769	3,760,812	35,591	39,113	10,857	47,457	6,119,942	3,086,619	3,033,322	-504,643
Hel. Air Serv.	93,890	.. .	92,868	.. .	.. .	.. .	.. .	78,497	43,885	34,612	14,393
Los Angeles	101,794	.. .	101,294	.. .	.. .	.. .	.. .	107,171	69,863	37,308	-5,877
NOTE: Under CAB filing procedures, the airlines file a cumulative quarterly financial report for January-March in place of a separate statement for the month of March. Traffic data, however, are reported separately for each month.											

# Alaskan Airline Traffic for 1949

AIRLINES	REVENUE PASSENGERS	REVENUE PASSENGER MILES	AVAILABLE SEAT MILES	PASSENGER LOAD FACTOR	MAIL TON-MILES	EXPRESS TON-MILES	FREIGHT TON-MILES	TOTAL TON-MILES REV. TRAFFIC	AVAILABLE TON-MILES FLOWN	% AVAILABLE TON-MILES USED	REVENUE PLANE-MILES	SCHEDULED MILES	% SCHEDULED MILES COMPLETED
Alaska	28,817	36,212,000	54,046,000	67.00	153,608	20,315	4,150,994	8,346,001	15,066,901	55.39	2,873,373	554,284	95.97
Alas. Coast	23,156	1,940,000	3,440,000	56.39	22,647	11,883	15,147	426,495	53.29	559,328	401,812	86.55	
Cordova	2,535	201,000	520,000	38.65	4,020	.. .	5,660	31,403	51.69	1,58,363	98,153	75.09	
Elles	29,306	1,717,000	3,497,000	49.09	6,140	10,953	.. .	182,524	34,020	53.31	473,377	260,162	90.37
E. Cananl.	9,773	2,082,000	3,023,000	34.56	90,873	3,915	155,400	467,854	886,745	52.76	796,134	546,570	97.10
Pac. North.	20,643	8,974,000	19,684,000	45.59	93,400	170,160	.. .	1,154,901	2,311,570	49.96	941,086	713,266	97.98
Reeve	2,221	1,380,000	3,419,000	40.36	73,878	.. .	118,467	344,065	605,211	56.85	306,155	226,455	96.83
Wien Alaska	4,657	1,527,000	3,760,000	40.63	32,477	.. .	162,061	351,018	567,938	61.80	863,084	492,299	80.16
TOTALS	121,108	54,033,000	94,769,000	57.24	477,072	216,835	4,615,729	11,105,064	30,268,623	54.70	6,960,900	3,295,201	91.92



# What's the success secret of Shell Airport Dealers?

## One Example: Shell's PLANNED UPGRADING of aircraft fuels and lubricants ...

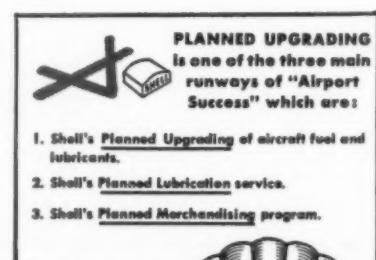
PLANNED UPGRADING of fuels is shown in the new *Shell 80/87 octane fuel*. This 80-octane fuel with a guaranteed minimum rich mixture rating of 87-octane was made available by Shell on a nation-wide basis in 1949. It is the fuel which has engine-manufacturer approval for many models in place of 91-octane\*.

Planned upgrading is also evident in the many Aeroshell Lubricants which meet the most exacting needs of modern aircraft. Such product superiority is the result of looking ahead, of anticipating needs, of continued research on a long-pull basis.

\*Write for an up-to-date list of engines for which 80/87 octane fuel is approved by engine makers.

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AMERICAN AVIATION

Including Features Formerly in AIRPORTS AND AIR CARRIERS Magazine

# Friendship — \$15 Million White Elephant?

By KEITH SAUNDERS

HERE WAS no question but that the new airport dedicated at Baltimore on June 24 is the largest and one of the finest commercial airfields in this country.

There was no question but that its \$3,724,000 terminal building is one of the most handsome and most functional in existence today in the U. S.

But there was and is one big question mark hanging over the \$15,000,000 Friendship International Airport. Can it reasonably be expected to make ends meet, or will it be a white elephant?

Baltimore was confident that it had made no mistake in voting \$12,000,000 of bonds toward the cost of building this super-airport as a successor to its obsolete Harbor Field. It could foresee that, with completion of the Washington-Baltimore Expressway some two or three years hence, Friendship might siphon off about one-third of the traffic from Washington's congested National Airport.

It had inserted the word "International" in the name of the new airport on the assumption that modern transport planes would be taking off from there for Paris, Calcutta, Buenos Aires and Copenhagen.

Had Baltimore been over-optimistic? There were those who thought so.

## Milk Run Stop

It is moot whether Baltimore has been a sort of "milk run" stop on the airlines for a long time because it did not have traffic sufficient to justify service with better equipment and schedules, or whether its traffic potential has been low because of the kind of air service that has been available to the city.

It is a fact, though, that the seventh or eighth largest city in the U. S. last year ranked 46th in the generation of air traffic, being surpassed by much smaller cities such as Atlanta, Louisville and Indianapolis. And it is a fact that the eight airlines serving the city have employed sales "blitzes"

and many other promotional devices but have been unable to make much of an increase in the city's air traffic.

Of course, the diversion to Friendship of one-third of the very substantial airline traffic of the nation's capital would boost Baltimore's traffic appreciably and might be sufficient to enable the new airport to meet expenses, but there is no certainty that such diversion will occur.

## Second Capital Airport?

The Civil Aeronautics Administration and the Air Transport Association have both plumped hard to construction of a second major airport to relieve the congestion at Washington National, and the site for such a field has been selected in nearby Virginia. Congress has been asked to appropriate money for the proposed airport, and the Senate committee has reported out the bill. As of last week, the companion measure still was bottled up in the House committee and Baltimore was hopeful it would stay there.

However, the odds favor eventual construction of a second major air-

port near Washington—much nearer than Friendship, which will be 30 miles and a minimum of 50 minutes away from downtown Washington even after the Expressway is completed.

But even if Washington has to go along indefinitely with its present airport, the use of Baltimore's new airport by air travelers bound to and from the capital is by no means a certainty. As long as Washington National Airport will accommodate them, flights serving Washington will use that facility.

It is not practical to expand the airport's physical size, but the truly determining factor—the rate at which it can accept aircraft arriving in instrument weather—will surely show further improvement as new and advanced navigational and landing aids become available. Just a few years ago when Baltimore was planning its new airport, the average delay encountered on instrument approaches to Washington National was one hour. Today it is about 20 minutes and further improvement is indicated.

Also, when Baltimore planned its

**Modern Terminal**—This aerial view of the \$3,724,000 terminal building at Friendship International Airport graphically shows the T-shaped configuration of the functional building, the vast expanses of ramp and apron space, the soaring control tower and the convenient parking lots with space for 1,800 automobiles.





**Long and Strong**—A sight to warm a pilot's heart is this view of the instrument runway at Baltimore's new airport. Stretching for nearly two miles (9,450 feet), the runway is 200 feet wide and is stressed to withstand weights of 450,000 pounds or more. It's said to be the longest and finest runway on any commercial airport in the U.S. today.

airport, the city was certificated as a co-terminal for a number of international air carriers, U. S.-flag and foreign-flag. Since then, the international lines flying the North Atlantic have pretty well concentrated their schedules at New York and Boston and are giving either the barest minimum of service or none at all to the other certificated co-terminals of Philadelphia, Washington, Detroit and Chicago.

And when the nation's capital, with its great potential of international air travel, does not have a single international flight (excepting Colonial to Bermuda), it is hardly reasonable to expect the international lines to fall over themselves to serve Baltimore through its new "international" airport.

Hence, it appears probable that the fine international wing at Friendship, with its wonderful facilities for customs, immigration and quarantine inspections, may be somewhat superfluous for a while, at least. At best, Baltimore can expect one or two or three international flights weekly in the foreseeable future, and inspectors assigned to the Port of Baltimore can be diverted to the airport to handle those.

### Two Handicaps

As far as domestic flights are concerned, Friendship has two strikes against it. In the first place, airline scheduling is based somewhat on traffic, and Baltimore has no demonstrated potential of traffic sufficient

to warrant much if any more service than it has been receiving through the old airport. Secondly, Friendship is too close to Washington National to make it operationally or economically feasible to serve both cities on the same flights if four-engined equipment is involved.

Since the airlines will continue to put the better schedules where the traffic is greater, it is probable that most of the DC-6's and Constellations, the nonstops to New York and Chicago and the one-stop flights to Miami or the west coast, will continue to overfly Baltimore.

So much for the dark side of the picture. On the brighter side, Baltimore can be proud of having an airport unequalled in many respects, an airport in which it is a good value for the money expended, and an airport which can readily be expanded to meet the city's needs perhaps *ad infinitum*.

### Good-Weather Site

The 3,200-acre site, protected by state and county zoning laws that assure obstruction-free approaches and a minimum 50-to-1 glide ratio, is said to be almost meteorologically perfect. Air drainage at the site is so good that the ceiling rarely is expected to fall below 200 feet, and fog is expected only five or six days a year.

By leveling hills, filling valleys and moving an aggregate of 6,300,000 cubic yards of dirt, the Baltimore firm of C. J. Langenfelder & Son,

Inc., created a man-made plateau 140 feet above sea level—highest elevation of any air terminal on the Atlantic seaboard.

The three-runway pattern is conventional but the runways are not. Employing a "super-compacting" method developed by the armed forces during the war, the contractor packed the sub-surfaces with a 200-ton roller to a consistency almost equal that of a common building brick and then poured the concrete on top, creating landing surfaces capable of taking loads up to 450,000 pounds.

The instrument runway is 200 feet wide and 9,450 feet long, the other two being 150 feet wide and 6,500 feet long. The airport is so engineered that each of the three strips can be paralleled if necessary, and the shorter ones have been graded to 8,000 feet to take care of possible future extensions. Concrete taxiways provide fairly easy access between the runways and the terminal area, and all taxiways are lighted and marked for the guidance of pilots.

### Terminal Building

Consolidated Engineering Company of Baltimore, which the multi-million-dollar terminal building at Friendship, did a creditable job in meeting its basic problem of providing a building designed for the distant future and constructed for the foreseeable future. It's a highly functional building.

The international wing, mentioned previously, runs straight back from the main lobby and wings off either



**High-up Tower**—The control tower at Friendship is one of the most modern in existence and perches atop the terminal building 9½ stories above ground level, commanding a clear view of the farthest reaches of the 3,200-acre airport.

side of the lobby complete the "T" shape of the structure. The control tower, which is nine stories up and 110 feet above ground level, affords an unobstructed view of all runways and approaches and the parking aprons.

A major feature is the separation of service functions from the passenger area. Incoming baggage enters the terminal at the basement level and is carted over to a common baggage counter 100 feet long which is connected with the lobby by escalators. Incoming passengers leave the



Connally



Clark

terminal at this level. Baggage of outgoing passengers is dropped down chutes to the basement and is carted out of the building to plane parking positions. All air mail and cargo is handled in the basement, which has ample handling and storage space and corridors wide enough to accommodate baggage carts, tractors and two trucks. The loading dock is at truck-bed level. Also, all airline operations offices are in the basement as well as the kitchen where in-flight meals will be prepared.

#### Adequate Counter Space

Eight airlines serve Baltimore at present. They are All American, American, Capital, Colonial, Eastern, National, TWA and United. Some are handling ticketing for others, so all will not have counter space, of which there is enough to meet all foreseeable future needs.

Blond mahogany plastic surfacing material, decorative metals, rich pastel colors and imported Italian Travertine give the lobby and the second floor of the terminal a pleasing decor.

The entire building is air conditioned.

Other features of the terminal area include free parking space for 1,800 cars, an automobile service station and apron pits equipped with electrical and air conditioning attachments and sewage disposal.

Manager of the airport is Carl Clark, who formerly was with the Airlines National Terminal Services Corporation at Detroit and Cincinnati. Overall supervision rests with the Baltimore City Airport Board, of which Donald H. Connally is executive director.

## AIRPORT NEWS DIGEST

- **Plans were drafted last week whereby the General Services Administration, which is authorized to do the leasing for all government departments and agencies, will negotiate individual "single package" contracts for leasing of space in international airports in the U. S. for Customs, Immigration, Agriculture, Public Health and Post Office.**

- **Teterboro Air Travel has opened a building at Teterboro Air Terminal for the exclusive use of non-scheduled plane operators and passengers. It includes a passenger waiting room, ready room for pilots, a control room, snack bar and rest rooms. Walter E. Lapp is president of the firm.**

- **Leases for counter and office space in the newly expanded portion of the temporary terminal building at N. Y. International Airport have been taken by Pan American World Airways, American Overseas Airlines, Northwest Airlines and British Overseas Airways Corporation for a period of five years at a rate of \$6.00 per square foot for counter space; \$4.00 for first-floor space, and \$3.00 for second-floor office space. The same carriers, plus TWA, have signed leases for space in the three new steel arch hangars at the airport.**

- **The proposal to establish a Greater Peoria Airport Authority was approved by a substantial majority in the recent special election there. Operation of the city's airport, heretofore vested in the park board, now will be placed in the hands of a five-member board of commissioners constituting a separate municipal agency.**

- **Development of a master plan that will provide the basis for an airport development program covering a 10- to 20-year period has been approved by the city commissioners of Dayton, Ohio. Cost of preparing the plan will be about \$15,000, with the CAA furnishing half the money.**

- **The former Curtiss-Wright Airport in Richmond Heights, Cleveland, closed by Federal injunction in 1931 and the subject of lengthy legal proceedings in the intervening years, has been reopened for use by lightplanes only. Field was purchased by Cuyahoga County in 1946, but efforts to operate it were stopped by residents of the area who sought to invoke the 18-year-old injunction originally won by owners of adjacent property. The county went to court and finally won its case.**

- **The east-west runway at Sky Harbor Airport, Phoenix, rebuilt and equipped with new lights at a cost of \$328,000, has been formally accepted by the CAA. The runway is 6,000 feet long and 200 feet wide.**

- **The instrument landing system at Worcester (Mass.) Municipal Airport, which was closed down last November because of malfunctioning, has been put back into commission after being relocated.**

- **The Air Space Sub-Committee of the Air Coordinating Committee has approved a plan whereby airlines operating into Springfield (Ohio) Municipal Airport will be controlled through a three-cornered communications setup linking Springfield, Wright-Patterson Air Force Base and the Cincinnati air traffic control office of CAA. The plan was to take effect about July 1 and will pave the way for instrument operations at Springfield, where they have been banned heretofore because of a conflict with military traffic in the area.**

- **The New Castle County Airport near Wilmington, Del., a surplus military airfield acquired from the War Assets Administration in 1946, has made a profit of \$136,321 on gross revenues of \$843,807 in the 45 months of civilian operations, according to a report prepared by Don W. Martin, manager.**

- **The Warren Northwest Co. has started grading operations preparatory to construction of a new 8,800-foot runway at Portland, Oregon. It is expected the \$1,500,000 runway project will be completed in early fall.**

- **The master plan for the terminal area at the New Bedford Municipal Airport has been approved by the Massachusetts Aeronautics Commission. An estimated \$260,000 has become available for the construction program this year, chief item in which is a proposed new administration building.**

**Reduction Chances 'Slim':**

## Low Volume Keeps Insurance Rates High for Operators

Why are aviation insurance rates for local operators so high? And what are the prospects for a reduction?

John H. White, of U. S. Aviation Underwriters, Inc., has a one-word answer for each of these two questions, both of which are of vital interest to those who own and operate airplanes and who are hard hit by the large insurance sums carried on their expense ledgers.

His answer to question No. 1 is "spread," and his answer to No. 2 is "slim." And the latter ties in very closely with the former, for there can be no appreciable reduction in aviation insurance rates until the spread—that is, the number of units covered or available to be insured—has increased sharply.

Going back to 1923, when aviation insurance underwriting got its start, White said the underwriter of that time was more of a gambler than an underwriter. He had something like 4,000 to 5,000 units available to insure at that time, and no experience on which to base his rates. And even today the total spread in the business is about 90,000 units, of which only about one-half are insured, which doesn't give the underwriter much of a base on which to work.

Contrast this with the spreads in the fire insurance business (about 50,000,000 units), the automobile insurance business (40,000,000), and the casualty business (100,000,000 units).

### Unfavorable Loss Ratio

Then there's the matter of experience, another factor that influences rates. The underwriters keep an accurate record of premiums and losses in each category of risk, such as fixed wing, rotary wing, seaplanes, etc. The loss ratio—percentage of losses to premiums collected—is not very favorable in the aviation underwriting line, according to White, who said:

"The fire man who has 40 or 50 million units and has experience over many years can run off figures on a certain class of business and can usually predict within a few percentage points what is going to happen next year. But look what happens to the aviation underwriter.

"Suppose we have a loss ratio in a particular category that is fair, that is, 40% to 50%. That means we have paid about half of what we have taken in. But just one loss in that certain cate-

gory can send our loss ratio up from 50% to 150%. That is extremely improbable in the automobile, fire or casualty business, but to us it is not only probable but has happened a number of times."

He cited the several millions of dollars of potential liability wrapped up in a single Boeing Stratocruiser as "catastrophe insurance at its worst."

White sketched his company's experience with the fixed-base operator to show why rates are high.

### High Rate Causes

In the matter of hull insurance, he said, the fixed-base operators in New York State, for example, have given the market a loss ratio of about 80%, which means the underwriter pays out

80¢ of every \$1.00 of premium to pay for hull losses. The passenger liability loss ratio for the fixed-base operator is almost equally as bad—76%.

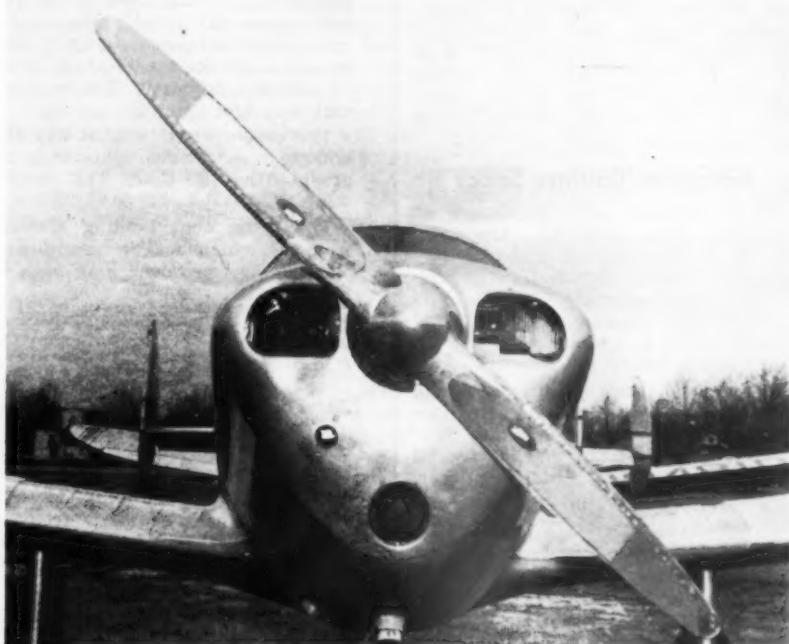
"An insurance company cannot operate on loss ratios like that," said White. "Something has to give. The only way we can continue to handle fixed-base operators' insurance is by taking premium from another category that is more profitable, and we can't do that forever."

The only answer, he continued, is to stop the losses or raise the rates, and rates already are just about as high as they can go if the operator is to have any semblance of soundness in his insurance program. Furthermore, he pointed out, a raise in rates would tend to reduce the number of units insured, thereby reducing the spread.

So the only alternative left to the fixed-base operators, according to White, is to face the fact that they need insurance but they can't have poor loss ratios and get lower rates.

The U. S. A. U. official cited hangar-keeper's liability as another good example of how the lack of spread works against aviation underwriters.

The loss ratio in this category, he said, is around 49%, which looks pretty good



**Flex-O-Prop**—Shown above is the newly certified Flex-O-Prop, manufactured by Munk Aeronautical Laboratory at Brentwood, Md. The construction of this wooden propeller is such that the blade tends to flatten out during high-power operation in such a manner that the blade effectively moves into low pitch insuring improved takeoff and climb performance. Although there are no moving parts, the propeller design enables the Flex-O-Prop to closely parallel performance of adjustable pitch propellers. The design shown here has been under test for about two years at the factory and at Sanders Aviation, Inc., Washington, D. C. Sanders acknowledges that the theoretical advantages are actually achieved in practice.

## LOCAL OPERATIONS

on the surface, but a little research reveals that the total premium taken in on hangarkeeper's liability is less than the limits of liability the underwriters have on a good many policies.

"In other words," he explained, "if the premium taken in is, say, half a million dollars, and we have half a million limit on any number of policies, the danger is obvious. Just one loss of the catastrophe type could easily wipe out all our premium for years."

Still another factor that affects rates, White said, is what is known as "judgment underwriting." Aviation rates are not fixed, as fire and automobile rates usually are, and each risk submitted is gone over very carefully.

"If the applicant is a fixed-base operator, we usually want to look at the physical aspect," the underwriter stated. "We want to know if you know what you are doing. We want to know how long you have been in business and whether you have made or lost money, your geographical location, the type of pilots and other employees you have, the type of equipment you operate, your housekeeping practices, etc. The underwriter then sits down and promulgates a rate, tempering it with some of the factors previously mentioned."

### Good Pays for Bad

"The thing that might make you a little unhappy," he continued, "is that the good operator has to pay for the bad one. We can't give money back to the good operator and still pay the bad operator's losses. That is a fundamental of insurance. When you have had a good loss ratio for a period of several years and look to your underwriter for a premium reduction, you probably will get it if the underwriter's experience hasn't been too bad, but if his experience has been poor you will have to help pay the other fellow's losses."

But judgment underwriting does do this, White added. You will generally receive a lower rate than the fellow next door who doesn't operate as well as you.

He said underwriters are a bit more optimistic now than for some time. Loss ratios seem to be improving generally, operators are making a good effort to reduce accidents, and there is reason to hope that this trend may prove a permanent one.

The pessimistic side, he concluded, is that without more spread—and that means without many more airplanes—the prospects are not too bright for a lowering of aviation insurance rates.

Twenty, 30 or 40 years from now, we may have several million aircraft and the owner then will probably pay a fraction of the rate he is paying today. But for the present, owners and operators of aircraft are paying for the fact that they are relatively pioneers in aviation.



Photo courtesy of: A. V. Roe Canada Limited

## HANDS ACROSS THE BORDER FOR THE DEFENSE OF AMERICA

THE Avro Canada twin-jet CF-100, heralded as the most powerful fighter in the world, is shown above having its hydraulic system and controls functional tested with the "Gig", the Greer Model PE3C-20V Test Machine.

This sleek black fighter is the first long-range, all-weather fighter of its type in the world and was especially designed to play a major role in the joint U.S.-Canadian defense of North America.

Operating such a swift air giant demands split-second response and positive action from its all-important controls. And, to maintain them in top-operating condition the aircraft is ground-checked at regular intervals under simulated flight conditions using Greer Test and Maintenance Equipment.

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# For Local Operators

## Some Reasons Why

"X" marks the spots where airports have been abandoned, from Washington, D. C., across the Texas Panhandle and on to San Diego. For a business that was booming at the end of the war, that had public enthusiasm and more trained pilots than this country has ever known, there has been a lot of folding.

Take a lightplane and fly it 6,500 miles and you'll encounter some of the reasons why.

You are coming in to land. If you're in an Ercoupe, you cross your legs and settle down and relax while you "drive" in circles over the airport, looking for the wind T. If there is one, regard it with suspicion—it may be anchored in place to save wear and tear. You look for the wind sock. It may be on any hangar or pole, off in a corner of the field or over the CAA communications station. Keep circling long enough at about 400' and eventually you'll find it. Of, if you're in a hurry, you have skipped the search for wind socks and T's and landed by lining up with a handy trail of smoke.

Around you is a vast expanse of former Air Force field, taken over for civilian use. But what civilian use where? Hangars to the north and scatterings of buildings around. As the saying goes, you pay your money and you take your choice, and you taxi in the direction of whatever looks human. It's a rare airport that has a "Transient Hangar" or a "This Way to the Gas Pit" sign.

Where to park? Anywhere you want as long as you keep your eyes open and dodge the rocks and stray chocks scattered around on the ramp and keep your nose wheel out of the holes. You pick a clear space and swing the plane into it. You cut your engine. And nothing happens. Nothing but sunshine and the birds and the bees.

You go for a walk.

Hangar doors are hospitably open, engines hanging around in various stages of repair, here and there the skeleton of a charred wing or a pile of twisted fuselage. Pools of oil on the floor, piles of oily rags in the corners, papers and dirt swept into neat ridges along the hangar walls. You come to a sign but it says, "Like Hell it's yours."

Along about hangar number three, you find a couple of mechanics involved in an engine. That is serious work and you don't mind waiting while they pull a few more wires, but you do have to have gas before you can fly on to Dallas. You stick around.

They're fine about servicing the plane. You start the engine and taxi it over to the secret gas pit, and your turn the switches off and stand by and watch. The elderly man who is filling the gas tanks takes a moment to light a cigarette as he puts the gas hose nozzle into the tank and starts the gas running.

"Afraid I'll explode? Heck no, I do this all the time.

"What? Need some oil? Well, I forgot my screw driver but I guess I can get at it with a nickle." After some pushing and twisting, the cowling comes open and proves that screw drivers are obsolete.

You look around the office while he's getting the change, and hope he has the change. "Can't understand what's happening to the business," he mutters, "Used to be a lot of people stop here but guess they think airplanes aren't practical."

You are hardly listening, you're reading the signs on the wall, "Flying is Fun: Flight School, Ground School, Charter Flights Here," and pondering the proximity of

the tacked-up slogan, "Enjoy yourself, it's later than you think."

Now you're not doing badly, understand. You're getting service, you're getting gas that he had stored at his own expense, and you've found someone to give it to you without having to crank the party-line phone and call town.

But you look at the Ercoupe, and it looks sad. Bugs are flattened out on the windshield, streaks of dust along the fuselage, and the nose wheel tire is a little flat.

## No Whisk Brooms

If you will eat crackers in the cockpit you will get crumbs in the carpeting but, after all, you ate those crackers miles ago and the cockpit hasn't been brushed out yet. Somewhere, in one of those \$2.00-a-night hangars, someone might have had a whisk broom. You think about the dry climate and asking one of the men to check the battery to see if the water has evaporated, but then you decide to let that wait too. It could come from a well.

And you think about Dr. W. O. Murphy of Amarillo who periodically flew his Bonanza into a small-town airport. "I had to land there, it was the closest field, but the first time I landed and taxied up to park, there was the manager sitting in the shade in a rocking chair. He looked at me and I looked at him but he didn't say anything not even, 'Do you need some gas?'" So I didn't say anything either, after all, it was his airport. This went on for about six flights and it added up to me having to make another stop for gas on my way home. Finally, I decided the whole thing was foolish and one day when I taxied up, I said, "Hello." He said, "Hello" and I got some gas.

"He's a good guy and I suspect that all that was wrong was he didn't want to run the risk of being snubbed by some city fellow in a Bonanza. But he's not the only one, these airports are full of rugged individuals who aren't going to help you until they decide you're O.K. I get along fine with them, but that's no way to run a business. If I pulled that on my patients, I'd be bankrupt."

And again, you think of Dr. Kahn of Ann Arbor, Dr. Lightstone of Wayne, Mich., and Dr. Dixon of Detroit who bought Bonanzas and Navions and finally got rid of them. Why?

How long would you keep your car if you had to go into the garage every morning, push several other cars out of the way, push your car out of the garage and turn it around in the direction you want to go before starting the motor? Or if you had to walk as far to get to the garage as you have to walk to get to the airport? Or if, every other time you stopped for gas, you had to go hunt through several buildings to find someone to sell it to you, and then they said "O.K., Bud!", didn't bother to put on a shirt, never made a move to clean your windshield or check your tires and went after any screw fastenings with a plugged nickle?

—BARBARA WARD

• A wall chart which tabulates state laws on civil aviation throughout the United States and its territories is available on request without charge from the CAA. The information on laws is itemized by states and is broken down into classifications such as Air Schools, Aviation Education, Crop Dusting, State Accident Investigation and Aviation Fuel Taxes. The chart, about 20 by 30 inches in size, is based on information assembled by the National Association of State Aviation Officials.

## CAA Specification Changes

Aeronca 15AC is approved for installation of Sevdy-Sorenson crop sprayer, if tank is placarded with maximum allowable tank weight and aircraft is certified and operated according to provisions of item 401 (e), CAA Supplement to Airplane Flight Manual, by Specification No. A-802. Approval also is given for installation of Koppers Aeromatic propeller F200/00-74E on C-145 damped engine.

Cessna 140A is approved for installation of C-85-12 and -14 engines, for landplane only, by Specification No. 5A2. Engines C-90-12F or -14F are eligible for installation on Cessna Models 120 and 140 landplanes and seaplanes, by Specification No. A-768.

Piper PA-20 is authorized use of tandem gear Model GW-100, weighing 46 lbs., by Specification No. 1A4.

Ryan Navion is approved use of Hartzel variable pitch, hub model propeller HC-12x20-1, -5 or -7 and blade model 8433 with engines having damped crankshafts, by Specification No. A-782.

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## WINGS OF YESTERDAY

### 25 Years Ago

Aircraft exports from the U. S. in 1924 were almost double those of 1923, totaling \$798,273, or \$364,715 more than in 1923.

The Woodson Engineering Co. of Bryan, Ohio, started production of a new commercial plane known as the Foto, which could be changed almost instantly from a comfortable passenger compartment into a mail or express compartment by simply folding the seats back out of the way.

The new Municipal Airport in Cleveland, Ohio, was officially opened on July 1, 1925.

### 10 Years Ago

(In AMERICAN AVIATION)

Col. Donald M. Connolly, U. S. Corps of Engineers, was named administrator of civil aeronautics, effective July 1, 1940. He succeeded Clinton M. Hester who resigned to enter private law practice.

Scadta and Saco air transport companies in Colombia were merged to form Avianca—National Airlines of Colombia—and all German technical and administrative personnel were replaced with North Americans.

United Air Lines instituted a 25% fare cut on its Los Angeles-San Francisco "local" run using Boeing 247's, and reported a load factor increase from 30% to 80%. Reduced roundtrip fare was \$25.00.

### LETTERS

#### Detachable Fuselage

To the Editor:

I read with a great deal of interest your article entitled "Revolution in Military Transport," by James J. Haggerty, Jr., in the June 1 issue of American Aviation. This

article relates to the use of detachable fuselage with Fairchild XC-120 claiming that it is novel because the entire fuselage may be detached from the plane either upon the ground in much the same manner as a transport truck detaches its trailer or in the air in which case the fuselage or pod would be floated to earth by giant specially designed parachutes.

A friend of mine, Robert M. Thomson, had that novel idea way back in 1928 and filed his first of three applications for patent on November 20, 1928. His invention received publicity on May 19, 1929 in the Miami Herald which quoted the inventor as follows: "The same idea of the detachable cabin might be used in warfare. The cabin, containing armed troops, might be dropped from the air and lowered to the ground by parachutes, the troops being ready for action when the cabin reached the ground."

"Or the detachable cabin loaded with bombs could be released over a battlefield or city, a special timing device dropping the bombs as the cabin floated to earth. There would be no danger to the airplane pilot who might have several such cabin sections in the plane and release them high in the air then return to the base point." In the same article he said, "Air freight is purely a matter of the future, yet it can be made practical with the detachable car which is loaded at the factory, and unloaded for the first time at the store."

Although this device was submitted to the government and private aviation interests, Mr. Thomson was unable to secure a sponsor. Still persisting in his theories, Mr. Thomson filed a second application July, 1933, which advocated the use of a parachute for lowering the cabin to the ground.

When World War II was in prospect, Mr. Thomson again brought the idea to the attention of the War Department and although his invention received national attention, he was unable to get a favorable recommendation.

Still persisting in 1943 Thomson enlarged upon his idea and conceived a multi-container plane which would carry many detachable units within the body of the plane. They could be inserted from beneath or from the rear. These containers could carry troops, supplies, or munitions in warfare, or mail, luggage, express and passengers in civil flight. Over a period of twenty-two years the inventor had advocated the use of the detachable unit to haul all commodities as well as passengers, and his files are full of letters of rejection; even Wright Field has received copies of his patents. No doubt the Fairchild Packplane is the outcome of his promotional activities.

Thomson believes that the detachable unit is still in its infancy. In conjunction with one of Sikorsky's long time helicopter engineers, Mr. Albert A. Green, now of Coral Gables, Mr. Thomson advocated the use of a detachable unit in connection with a helicopter.

So you see this revolutionary idea has taken many years to reach its present stage. All credit should not go to Fairchild or to the army for its initial promotional work.

KENNETH BENSON  
Miami, Fla.

(Editor's Note: AMERICAN AVIATION did not intend to imply that the theory of detachable fuselage aircraft is new. We are well aware that others advanced the theory before Fairchild Aircraft Division went ahead with the prototype. Armand Thiebold, Fairchild Aircraft's chief engineer, states that he himself has been toying with the idea since 1939. However, the XC-120 is the first airplane ever built to employ the detachable fuselage principle and as such it is felt that the term "novel" is fitting. While not wishing to detract from Mr. Thomson's idea, which was certainly advanced for its time, we feel that Fairchild should get full credit for solving the complicated engineering problems attendant upon this type of development.)

### BOOKS

ECONOMICS OF TRANSPORTATION, by Marvin L. Fair and Ernest W. Williams, Jr. Published by Harper & Brothers, New York. 745 pages. Price \$5.50.

This book treats of the economics of the American transportation system—rail, water, air, highway and pipeline. It is unusually thorough in its analysis of the economics of transportation service, treatment of transportation rates and their application in the light of existing regulations, and consideration of transportation agencies and their functioning. One chapter deals specifically with air transportation, which also is treated to some extent in a number of others.

THE SLOPE LINE APPROACH LIGHT SYSTEM. By H. J. Cory Pearson. Published by CAA Technical Development and Evaluation Center, Indianapolis, as Technical Development Report No. 104.

This is a 37-page review of the high intensity approach light problem with particular reference to the slope line system, which the author helped develop.

PILOT'S HANDBOOK OF CIVIL AIR REGULATIONS. Published by Ross Publications, P. O. Box 2092, Arlington 4, Va.

A convenient and comprehensive compilation of Civil Air Regulations for pilots, including CAR Parts 20, 29, 43, 60 and 61. Dimensions are approximately 3 x 6 inches.

MANUAL OF FATIGUE TESTING. Prepared by Committee E-9 on Fatigue of the American Society for Testing Materials. Available from the ASTM, 1916 Race Street, Philadelphia, Pa. 88 pages. \$2.50 in heavy paper cover, \$3.15 in cloth cover.

### OBITUARY

#### A. L. Beall

A. L. Beall, assistant to the chief engineer of Wright Aeronautical Corp. and an internationally-known authority on aircraft fuels and lubricants, died June 17 at his home at Packanack Lake, N. J. Beall, with Wright since 1933, was 60.

#### Gen. T. S. Hammond

Gen. Thomas Stevens Hammond, a member of the board of directors of American Airlines and chairman of the board of the Whiting Corporation, Harvey, Illinois, died June 15 at his home, 1448 Lake Shore Drive, Chicago.

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# IN FLIGHT

A PAGE FOR ALL PILOTS



## Man or Monkey?

A pilot yardstick has been developed over a period of years by E. L. Stephenson of Associated Aviation Underwriters:

"Most of the hundreds of old pilots we have known for 20 years have certain common characteristics. First of all, they are good men. Apparently you have to be a pretty good man before you can be a safe pilot. It takes real character, judgment, mental stability and poise. In the air as on the sea, you deal with fundamentals—and you play for keeps. You have to be a simple, uncomplicated person to think straight. The elements teach you to respect them and no man who has faced them for long can be other than quietly humble.

"Pilot skill is secondary because a man of good judgment will know his own ability and will know what he faces in a given situation and will never bite off more than he can chew. Abraham Lincoln would have made a good pilot. Mussolini would probably have become a statistic.

"Of course, there are a few old timers who are fugitives from the law of averages. Every once in a while we bury one of them because his luck ran out. We knew of one who was getting a 5% kick-back from the repair shop on all maintenance. This poor judgment later showed up in the cockpit and he crashed and burned.

"This type of pilot also has certain characteristics in common. Most of them started flying because they had inferiority complexes and they thought there was adventure and glamour in flying that would inflate their egos and make them feel important. They became king for an hour—and an insurance company statistic for eternity. This inferiority complex is back of all 'showing off' and is the greatest pilot killer of all.

"They may actually know a lot about various phases of flying and may have phenomenal coordination and flying skill and may have got out of lots of tight spots, that a man of better judgment would not have been in. The plain truth is that a lot of them just do not measure up as men. They lack stability and dependability.

"You can teach a monkey a high degree of skill in handling the controls of a plane, and he might even pass a check ride, but would he deliver when the chips were down? As aviation underwriters we have to separate the men from the monkeys—or go broke."

## PAA's Shorty Clark

Another airline pilot will be retiring soon upon reaching 60 years of age. He's Capt. Fred V. (Shorty) Clark, of Pan American World Airways. Recently Capt. Clark passed his 42nd six-month flight check. He'll be 60 on Jan. 1, 1951, and will retire after 21 years' service with PAA during which time he to date has piled up 20,925 hours and over 3,000,000 miles of flying without even a minor accident. Capt. Clark has been flying since World War I, in which he served as an observer and gunnery warrant officer. At war's end he completed the Navy's regular flight training course and became the 10th naval aviation pilot to win his wings. He flew for the Navy until 1929, when he joined AA. His "firsts," according to PAA, include flying the



Clark

first air mail from South America to the U. S. in 1930. First airline pilot to retire at 60 was Capt. Willis Proctor, of American Airlines.

## Balanced Hazards

Peter Masefield, chief executive of British European Airways, speaking in Montreal recently, talked about the greater speed and comfort of the turbine transport but he did not specifically mention its added safety. If this omission was deliberate he is certainly right in the sense that there is not necessarily greater safety in a turbine-powered transport due to the low-volatility fuel but that one kind of risk is substituted for another.

There is less danger of death or injury by fire in a turbine transport after an accident because kerosene does not burn so viciously, but the increased airmanship demanded of the pilot to cope with the short endurance characteristics suggests that what is gained by the less lethal nature of a crash-fire is lost by the greater possibility of a mishap.

The basic causes of possible disaster in a turbine transport beyond those normally encountered in any aircraft are hazards due to flying at an altitude which will not support life without a pressure cabin, the possibility of failure to make a low-level diversion and the greater sensitivity of the engine to the reduced altitude necessary for three-engine flight. The greater hazard following radio failure is probably balanced by the reduced vibration which is correspondingly less likely to engender such trouble.

## Civil and Military Mach Numbers

Civil and military authorities do not have the same concepts of the critical mach number and limitations are imposed for different reasons. Choice of the same phraseology to express these limitations should not obscure the fundamentals upon which the restrictions are based.

Military people wish to arrive at the mach number in a fighter design at which disturbances affect the trim of the aircraft and make gun aiming or rocket ranging impractical. Having established this point at which the aircraft in effect ceases to be a weapon, they then need to know the maneuver margins available above this which the pilot can use in combat either for resuming an attack or, if he is getting the worst of the fight, for escape. The critical mach number is well known to all concerned but this additional margin is not clearly apparent in any cockpit. However it becomes evident to the pilot after familiarization and following trial and error.

The primary object of the designer is to produce an aircraft which will give the pilot a smooth ride all the way up to the point where control is lost. The aircraft then remains a weapon over its full speed range.

The civil authorities work it the other way and first decide upon a "never exceed" speed from flight trials determined by buffeting, and by disturbances to the passengers' frame of mind, or structural limitations, whichever is the lesser. This speed and altitude is translated into a mach number and the aircraft is placarded at nine-tenths of this figure, which is considered a suitable margin for inadvertent speed increases.



(Note: Mr. Parrish left Washington May 25 to participate in the inauguration of service to Buenos Aires, Argentina, by Braniff International Airways. He will return from a tour of South America by way of Europe and begin writing about this trip in the July 15 issue.)

**Choo Choo.** Have you ever ridden in one of them there new-fangled streamlined trains with the hothouse dome on top? Pardner, it's quite an experience.

I had to go down to my home town of Decatur, Ill., the other day and the only transportation back to Chicago was the Wabash Railroad. Decatur is the largest city in the country not adjacent to a large metropolitan area that doesn't have air service. It has a fine airport and Parks Air Lines is certificated but Parks has never gotten started or hadn't as this is written. I've ridden the Wabash many times and I can't say that I've considered it to be a privilege, although it has a non-stop train that rolls along at an average of 60 miles per hour.

Like some other railroads, the Wabash decided finally to do something about its equipment. It ordered "the most modern train in America" and I won't dispute this claim partly because I'm no expert on trains and partly because I don't see how there could be a better train.

This streamlined Diesel-powered Blue Bird, as they call it, has a minor sensation out in the prairies. It leaves St. Louis in the morning and returns from Chicago in the late afternoon—285 miles each way, five hours for the trip, and not many stops. I don't think there's any doubt that it will generate some traffic and recapture some traffic that had been lost.



**Service!** I called the station the night before to reserve a seat. That was the first surprise. Always before I had been told "no," that I'd have to take a chance when the train came in. This time a guy with a brisk and not unpleasant voice confirmed a seat right away. Not only that but I didn't have to pick up my ticket ahead of time. I asked about those domes and how one

got a seat in them and the voice said there was nothing to it, your seat in the parlor car entitled you to a seat upstairs, too.

I got to the station ahead of time and was surprised to see quite a crowd—about a DC-4 load full—waiting for the train. Last time there hadn't been so many. I got my ticket with minimum of bother. The train was about 20 minutes late but finally I saw it round the curve in the west end of town and head eastward toward the station. No smoke. The headlight was on although it was daytime. Then I heard what sounded like a souped up automobile or bus horn, unlike anything I've heard before on a railroad. Quite fancy.



**Hothouse Dome.** The Blue Bird rolled smoothly to a stop and I hiked myself into this glistening alloy caterpillar and found my seat. Everything was plush, shining and decorated in good taste. I didn't waste any time finding the stairway to the dome, thinking that maybe I wouldn't find a seat, but there were plenty of seats available for the entire trip. Not only that, but there were domes up ahead on the coach cars.

Far from being hot, the dome was cool as a cucumber and the polarized glass eliminated all of the glare. By the time I sat down the train pulled out. No bumps. No crashing. The big surprise was the quietness of the cars and the dome. There was an airplane-type ash tray. And a voice came out of a loud-speaker announcing dining service. You actually had a choice, the dining car or a snack bar. I read in the timetable that we were to have music, too, but something seemed to be out of order with that.

I saw the east end of my home town as I had never seen it before. Somehow, sitting up high in the cool with lots of visibility, the railroad yards and the Staley Starch Works and all the rest of the industrial area didn't seem so dirty as they once had. And when we passed a freight train I was above it and hardly noticed it at all. My one fear was having the dome sheered off by an overpass but it never quite happened.

**Non-Spilling Coffee.** As the miles ticked off I looked over the rich prairie land that our forefathers found and made into the breadbasket of the world. The farms looked good. The fields were all cultivated. Every growing thing was green. Each little town had its grain elevator. The midwest paraded by on a new level. I wasn't looking down from a height, as in an airplane, yet one had a much better perspective from the dome than from the ordinary railroad seat close to the ground. Sort of like a 6-footer looking around over a crowd of small people.

After an hour or so I went to the diner. Tastefully decorated. Correctly cool. The menu was adapted to both light and heavy meals. The service and food were good. I could hardly believe I was on a train. Not that it was as smooth as an airplane ride, it wasn't, but it was so much smoother than the Pennsylvania trains I've had to ride on in the past few years. I've never had such a smooth ride on the rails. The coffee didn't lurch out over the table and when I picked up a bite of food I was able to direct it easily to my mouth instead of getting it almost to the mouth and have the train lurch suddenly and have the food on my face.

Sitting in the dome was pleasant enough but somehow the train didn't seem to be going very fast. Actually it rolled along at 60 mph, which isn't bad, but the additional height of the dome gives the opposite impression. The three hours to Chicago passed easily enough, but after two hours I kept wanting the train to hurry up. I had "altitude" but no speed.



**Clean, Too.** At Chicago I jumped on a DC-6 and flew to Washington in less time than it had taken to go the 172 miles to the Windy City. All I can say is that I would hate to go by train when I can fly, but I will have to admit this much: if flying is impossible, I can't think of a nicer way to go than on the Blue Bird. It was a very pleasant experience. (And a clean one, too). The railroads have proven, many decades later, that they can provide transportation as comfortable as can be obtained considering the handicap of operating on rails.

There's no doubt that they've borrowed from the airlines—and that the airlines spurred them into action. Having listened all my earlier years to the wailing of the Wabash locomotive whistle day and night in my home town, I must give it credit. I didn't think it would ever do it—but it has. I'll go along with its claim that it has the "most modern train in America."

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